This document contains all your take-home projects for MA 238 2020 Spring. For each project, complete the version number assigned to you based upon the first five characters of your Jagmail address, given below.

- Version 2001: abh17
- Version 2002: adm19
- Version 2003: ags17
- Version 2004: ama18
- Version 2005: ams15
- Version 2006: bgb16
- Version 2007: bpm17
- Version 2008: cdc18
- Version 2009: dba17
- Version 2010: dd172
- Version 2011: dpj17
- Version 2012: emh16
- Version 2013: erm17
- Version 2014: gfs17
- Version 2015: jsr17
- Version 2016: kls15
- Version 2017: knm17
- Version 2018: lvt17
- Version 2019: lwc16
- Version 2020: mb182
- Version 2021: mce17
- Version 2022: mlc17
- Version 2023: mnh17
- Version 2024: nmp11
- Version 2025: oa172
- Version 2026: rmb17
- Version 2027: sp110
- Version 2028: sre10
- Version 2029: tts17
- Version 2030: twh16
- Version 2031: vhn17
- Version 2032: vtp16

Standard C3m

Version 2001

A water droplet with a radius of 0.0000199 meters has a mass of about 2.46×10^{-12} kilograms and a downward terminal velocity of approximately 0.213 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2002

A water droplet with a radius of 0.0000454 meters has a mass of about 2.94×10^{-11} kilograms and a downward terminal velocity of approximately 0.322 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2003

A water droplet with a radius of 0.0000448 meters has a mass of about 2.83×10^{-11} kilograms and a downward terminal velocity of approximately 0.320 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2004

A water droplet with a radius of 0.0000300 meters has a mass of about 8.52×10^{-12} kilograms and a downward terminal velocity of approximately 0.262 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2005

A water droplet with a radius of 0.000301 meters has a mass of about 8.55×10^{-9} kilograms and a downward terminal velocity of approximately 0.829 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2006

A water droplet with a radius of 0.000300 meters has a mass of about 8.49×10^{-9} kilograms and a downward terminal velocity of approximately 0.828 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2007

A water droplet with a radius of 0.000188 meters has a mass of about 2.08×10^{-9} kilograms and a downward terminal velocity of approximately 0.655 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2008

A water droplet with a radius of 0.000133 meters has a mass of about 7.45×10^{-10} kilograms and a downward terminal velocity of approximately 0.552 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2009

A water droplet with a radius of 0.000384 meters has a mass of about 1.78×10^{-8} kilograms and a downward terminal velocity of approximately 0.937 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2010

A water droplet with a radius of 0.000232 meters has a mass of about 3.92×10^{-9} kilograms and a downward terminal velocity of approximately 0.728 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2011

A water droplet with a radius of 0.000214 meters has a mass of about 3.10×10^{-9} kilograms and a downward terminal velocity of approximately 0.700 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2012

A water droplet with a radius of 0.0000294 meters has a mass of about 7.95×10^{-12} kilograms and a downward terminal velocity of approximately 0.259 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2013

A water droplet with a radius of 0.0000312 meters has a mass of about 9.54×10^{-12} kilograms and a downward terminal velocity of approximately 0.267 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2014

A water droplet with a radius of 0.0000126 meters has a mass of about 6.36×10^{-13} kilograms and a downward terminal velocity of approximately 0.170 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity

is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2015

A water droplet with a radius of 0.000350 meters has a mass of about 1.34×10^{-8} kilograms and a downward terminal velocity of approximately 0.894 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2016

A water droplet with a radius of 0.000318 meters has a mass of about 1.01×10^{-8} kilograms and a downward terminal velocity of approximately 0.853 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2017

A water droplet with a radius of 0.000117 meters has a mass of about 5.09×10^{-10} kilograms and a downward terminal velocity of approximately 0.518 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2018

A water droplet with a radius of 0.000251 meters has a mass of about 4.96×10^{-9} kilograms and a downward terminal velocity of approximately 0.757 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2019

A water droplet with a radius of 0.0000189 meters has a mass of about 2.13×10^{-12} kilograms and a downward terminal velocity of approximately 0.208 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2020

A water droplet with a radius of 0.000138 meters has a mass of about 8.21×10^{-10} kilograms and a downward terminal velocity of approximately 0.561 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2021

A water droplet with a radius of 0.000105 meters has a mass of about 3.60×10^{-10} kilograms and a downward terminal velocity of approximately 0.489 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2022

A water droplet with a radius of 0.000113 meters has a mass of about 4.58×10^{-10} kilograms and a downward terminal velocity of approximately 0.509 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2023

A water droplet with a radius of 0.0000168 meters has a mass of about 1.49×10^{-12} kilograms and a downward terminal velocity of approximately 0.196 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity

is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2024

A water droplet with a radius of 0.000360 meters has a mass of about 1.47×10^{-8} kilograms and a downward terminal velocity of approximately 0.907 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2025

A water droplet with a radius of 0.000326 meters has a mass of about 1.09×10^{-8} kilograms and a downward terminal velocity of approximately 0.863 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2026

A water droplet with a radius of 0.000306 meters has a mass of about 8.99×10^{-9} kilograms and a downward terminal velocity of approximately 0.836 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2027

A water droplet with a radius of 0.0000236 meters has a mass of about 4.11×10^{-12} kilograms and a downward terminal velocity of approximately 0.232 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2028

A water droplet with a radius of 6.20×10^{-6} meters has a mass of about 7.48×10^{-14} kilograms and a downward terminal velocity of approximately 0.119 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2029

A water droplet with a radius of 0.0000996 meters has a mass of about 3.10×10^{-10} kilograms and a downward terminal velocity of approximately 0.477 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2030

A water droplet with a radius of 0.000294 meters has a mass of about 8.01×10^{-9} kilograms and a downward terminal velocity of approximately 0.820 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2031

A water droplet with a radius of 9.59×10^{-6} meters has a mass of about 2.77×10^{-13} kilograms and a downward terminal velocity of approximately 0.148 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2032

A water droplet with a radius of 0.000316 meters has a mass of about 9.93×10^{-9} kilograms and a downward terminal velocity of approximately 0.850 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity

is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2033

A water droplet with a radius of 0.000177 meters has a mass of about 1.74×10^{-9} kilograms and a downward terminal velocity of approximately 0.636 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2034

A water droplet with a radius of 0.000249 meters has a mass of about 4.84×10^{-9} kilograms and a downward terminal velocity of approximately 0.754 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2035

A water droplet with a radius of 0.000364 meters has a mass of about 1.52×10^{-8} kilograms and a downward terminal velocity of approximately 0.912 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2036

A water droplet with a radius of 0.000413 meters has a mass of about 2.21×10^{-8} kilograms and a downward terminal velocity of approximately 0.971 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2037

A water droplet with a radius of 0.000285 meters has a mass of about 7.27×10^{-9} kilograms and a downward terminal velocity of approximately 0.807 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2038

A water droplet with a radius of 0.000114 meters has a mass of about 4.63×10^{-10} kilograms and a downward terminal velocity of approximately 0.510 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2039

A water droplet with a radius of 0.000149 meters has a mass of about 1.03×10^{-9} kilograms and a downward terminal velocity of approximately 0.583 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2040

A water droplet with a radius of 0.000175 meters has a mass of about 1.69×10^{-9} kilograms and a downward terminal velocity of approximately 0.633 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2041

A water droplet with a radius of 0.000174 meters has a mass of about 1.66×10^{-9} kilograms and a downward terminal velocity of approximately 0.631 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity

is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2042

A water droplet with a radius of 0.0000693 meters has a mass of about 1.05×10^{-10} kilograms and a downward terminal velocity of approximately 0.398 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.04 seconds.

Version 2043

A water droplet with a radius of 0.0000265 meters has a mass of about 5.84×10^{-12} kilograms and a downward terminal velocity of approximately 0.246 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2044

A water droplet with a radius of 0.000167 meters has a mass of about 1.47×10^{-9} kilograms and a downward terminal velocity of approximately 0.618 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2045

A water droplet with a radius of 0.000402 meters has a mass of about 2.05×10^{-8} kilograms and a downward terminal velocity of approximately 0.959 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2046

A water droplet with a radius of 0.000227 meters has a mass of about 3.67×10^{-9} kilograms and a downward terminal velocity of approximately 0.720 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.02 seconds.

Version 2047

A water droplet with a radius of 0.000275 meters has a mass of about 6.50×10^{-9} kilograms and a downward terminal velocity of approximately 0.792 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2048

A water droplet with a radius of 0.000244 meters has a mass of about 4.58×10^{-9} kilograms and a downward terminal velocity of approximately 0.747 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2049

A water droplet with a radius of 0.0000772 meters has a mass of about 1.45×10^{-10} kilograms and a downward terminal velocity of approximately 0.420 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Version 2050

A water droplet with a radius of 0.000135 meters has a mass of about 7.78×10^{-10} kilograms and a downward terminal velocity of approximately 0.556 meters per second.

Write an initial value problem (IVP) modeling the velocity of this water droplet when dropped from rest, assuming that the acceleration due to gravity

is roughly 9.8 m/s^2. Then solve this IVP to compute the droplet's velocity after 0.03 seconds.

Standard C7m

Version 2001

A mass of 4 kg is attached to a certain spring such that 64 Newtons of force is required to stretch the mass 4 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 7.5 seconds.

Version 2002

A mass of 4 kg is attached to a certain spring such that 18 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 5.5 seconds.

Version 2003

A mass of 4 kg is attached to a certain spring such that 100 Newtons of force is required to stretch the mass 4 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 6.3 seconds.

Version 2004

A mass of 4 kg is attached to a certain spring such that 27 Newtons of force is required to stretch the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 7.9 seconds.

Version 2005

A mass of 25 kg is attached to a certain spring such that 27 Newtons of force is required to compress the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 5.3 seconds.

Version 2006

A mass of 25 kg is attached to a certain spring such that 48 Newtons of force is required to compress the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 3.1 seconds.

Version 2007

A mass of 16 kg is attached to a certain spring such that 27 Newtons of force is required to compress the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 9.7 seconds.

Version 2008

A mass of 16 kg is attached to a certain spring such that 27 Newtons of force is required to stretch the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 9.3 seconds.

Version 2009

A mass of 25 kg is attached to a certain spring such that 12 Newtons of force is required to stretch the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 5.5 seconds.

Version 2010

A mass of 16 kg is attached to a certain spring such that 8 Newtons of force is required to stretch the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 8.7 seconds.

Version 2011

A mass of 16 kg is attached to a certain spring such that 75 Newtons of force is required to stretch the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 8.3 seconds.

Version 2012

A mass of 4 kg is attached to a certain spring such that 75 Newtons of force is required to stretch the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 3.6 seconds.

Version 2013

A mass of 4 kg is attached to a certain spring such that 32 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 1.1 seconds.

Version 2014

A mass of 4 kg is attached to a certain spring such that 125 Newtons of force is required to stretch the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 9.7 seconds.

Version 2015

A mass of 25 kg is attached to a certain spring such that 45 Newtons of force is required to stretch the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 2.8 seconds.

Version 2016

A mass of 25 kg is attached to a certain spring such that 80 Newtons of force is required to compress the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 1.2 seconds.

Version 2017

A mass of 9 kg is attached to a certain spring such that 125 Newtons of force is required to compress the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 4.5 seconds.

Version 2018

A mass of 16 kg is attached to a certain spring such that 75 Newtons of force is required to compress the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 2.0 seconds.

Version 2019

A mass of 4 kg is attached to a certain spring such that 36 Newtons of force is required to compress the mass 4 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 7.5 seconds.

Version 2020

A mass of 16 kg is attached to a certain spring such that 27 Newtons of force is required to stretch the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 2.7 seconds.

Version 2021

A mass of 9 kg is attached to a certain spring such that 125 Newtons of force is required to compress the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 2.2 seconds.

Version 2022

A mass of 9 kg is attached to a certain spring such that 48 Newtons of force is required to compress the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 3.9 seconds.

Version 2023

A mass of 4 kg is attached to a certain spring such that 18 Newtons of force is required to stretch the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 1.9 seconds.

Version 2024

A mass of 25 kg is attached to a certain spring such that 18 Newtons of force is required to stretch the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 1.6 seconds.

Version 2025

A mass of 25 kg is attached to a certain spring such that 64 Newtons of force is required to stretch the mass 4 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 5.7 seconds.

Version 2026

A mass of 25 kg is attached to a certain spring such that 8 Newtons of force is required to stretch the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 6.8 seconds.

Version 2027

A mass of 4 kg is attached to a certain spring such that 18 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 9.5 seconds.

Version 2028

A mass of 4 kg is attached to a certain spring such that 45 Newtons of force is required to compress the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 3.8 seconds.

Version 2029

A mass of 9 kg is attached to a certain spring such that 64 Newtons of force is required to stretch the mass 4 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 3.2 seconds.

Version 2030

A mass of 25 kg is attached to a certain spring such that 8 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 5.2 seconds.

Version 2031

A mass of 4 kg is attached to a certain spring such that 80 Newtons of force is required to stretch the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 2.0 seconds.

Version 2032

A mass of 25 kg is attached to a certain spring such that 32 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 7.5 seconds.

Version 2033

A mass of 16 kg is attached to a certain spring such that 50 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 9.1 seconds.

Version 2034

A mass of 16 kg is attached to a certain spring such that 125 Newtons of force is required to stretch the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 9.4 seconds.

Version 2035

A mass of 25 kg is attached to a certain spring such that 20 Newtons of force is required to stretch the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 5.3 seconds.

Version 2036

A mass of 25 kg is attached to a certain spring such that 32 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 6.2 seconds.

Version 2037

A mass of 25 kg is attached to a certain spring such that 18 Newtons of force is required to stretch the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 6.2 seconds.

Version 2038

A mass of 9 kg is attached to a certain spring such that 50 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 8.8 seconds.

Version 2039

A mass of 16 kg is attached to a certain spring such that 12 Newtons of force is required to stretch the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 4.8 seconds.

Version 2040

A mass of 16 kg is attached to a certain spring such that 45 Newtons of force is required to compress the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 5.3 seconds.

Version 2041

A mass of 16 kg is attached to a certain spring such that 100 Newtons of force is required to stretch the mass 4 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 2.6 seconds.

Version 2042

A mass of 9 kg is attached to a certain spring such that 50 Newtons of force is required to stretch the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 1.7 seconds.

Version 2043

A mass of 4 kg is attached to a certain spring such that 100 Newtons of force is required to stretch the mass 4 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 1.0 seconds.

Version 2044

A mass of 16 kg is attached to a certain spring such that 27 Newtons of force is required to stretch the mass 3 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 6.3 seconds.

Version 2045

A mass of 25 kg is attached to a certain spring such that 8 Newtons of force is required to stretch the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 4.8 seconds.

Version 2046

A mass of 16 kg is attached to a certain spring such that 8 Newtons of force is required to stretch the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 3.2 seconds.

Version 2047

A mass of 25 kg is attached to a certain spring such that 80 Newtons of force is required to stretch the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 8.7 seconds.

Version 2048

A mass of 16 kg is attached to a certain spring such that 45 Newtons of force is required to compress the mass 5 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 2.3 seconds.

Version 2049

A mass of 9 kg is attached to a certain spring such that 32 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 9.2 seconds.

Version 2050

A mass of 16 kg is attached to a certain spring such that 18 Newtons of force is required to compress the mass 2 meters from its natural position.

Write an initial value problem (IVP) modeling the position of this mass when released from rest. Then solve this IVP to compute the mass's position after 7.7 seconds.

Standard F3m

Version 2001

A mass of 3 kg is thrown horizontally with an initial velocity of 6 meters per second, experiencing an initial air resistance of 6.84 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 7 seconds.

Version 2002

A mass of 3 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 3.04 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Version 2003

A mass of 3 kg is thrown horizontally with an initial velocity of 9 meters per second, experiencing an initial air resistance of 15.4 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 6 seconds.

Version 2004

A mass of 3 kg is thrown horizontally with an initial velocity of 2 meters per second, experiencing an initial air resistance of 0.760 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 4 seconds.

Version 2005

A mass of 8 kg is thrown horizontally with an initial velocity of 5 meters per second, experiencing an initial air resistance of 18.5 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 5 seconds.

Version 2006

A mass of 8 kg is thrown horizontally with an initial velocity of 6 meters per second, experiencing an initial air resistance of 26.6 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 5 seconds.

Version 2007

A mass of 6 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 7.36 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 5 seconds.

Version 2008

A mass of 6 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 7.36 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 4 seconds.

Version 2009

A mass of 9 kg is thrown horizontally with an initial velocity of 3 meters per second, experiencing an initial air resistance of 8.19 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 5 seconds.

Version 2010

A mass of 7 kg is thrown horizontally with an initial velocity of 2 meters per second, experiencing an initial air resistance of 2.36 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 3 seconds.

Version 2011

A mass of 7 kg is thrown horizontally with an initial velocity of 9 meters per second, experiencing an initial air resistance of 47.8 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 5 seconds.

Version 2012

A mass of 3 kg is thrown horizontally with an initial velocity of 2 meters per second, experiencing an initial air resistance of 0.760 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 9 seconds.

Version 2013

A mass of 3 kg is thrown horizontally with an initial velocity of 7 meters per second, experiencing an initial air resistance of 9.31 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 3 seconds.

Version 2014

A mass of 2 kg is thrown horizontally with an initial velocity of 9 meters per second, experiencing an initial air resistance of 11.3 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 8 seconds.

Version 2015

A mass of 9 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 14.6 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 9 seconds.

Version 2016

A mass of 8 kg is thrown horizontally with an initial velocity of 8 meters per second, experiencing an initial air resistance of 47.4 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 7 seconds.

Version 2017

A mass of 5 kg is thrown horizontally with an initial velocity of 5 meters per second, experiencing an initial air resistance of 8.75 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 8 seconds.

Version 2018

A mass of 7 kg is thrown horizontally with an initial velocity of 6 meters per second, experiencing an initial air resistance of 21.2 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 6 seconds.

Version 2019

A mass of 2 kg is thrown horizontally with an initial velocity of 3 meters per second, experiencing an initial air resistance of 1.26 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 4 seconds.

Version 2020

A mass of 6 kg is thrown horizontally with an initial velocity of 5 meters per second, experiencing an initial air resistance of 11.5 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 4 seconds.

Version 2021

A mass of 5 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 5.60 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 9 seconds.

Version 2022

A mass of 5 kg is thrown horizontally with an initial velocity of 7 meters per second, experiencing an initial air resistance of 17.2 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 5 seconds.

Version 2023

A mass of 2 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 2.24 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Version 2024

A mass of 9 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 14.6 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 3 seconds.

Version 2025

A mass of 8 kg is thrown horizontally with an initial velocity of 7 meters per second, experiencing an initial air resistance of 36.3 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 6 seconds.

Version 2026

A mass of 8 kg is thrown horizontally with an initial velocity of 3 meters per second, experiencing an initial air resistance of 6.66 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 3 seconds.

Version 2027

A mass of 3 kg is thrown horizontally with an initial velocity of 3 meters per second, experiencing an initial air resistance of 1.71 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 3 seconds.

Version 2028

A mass of 2 kg is thrown horizontally with an initial velocity of 5 meters per second, experiencing an initial air resistance of 3.50 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 9 seconds.

Version 2029

A mass of 5 kg is thrown horizontally with an initial velocity of 6 meters per second, experiencing an initial air resistance of 12.6 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 6 seconds.

Version 2030

A mass of 8 kg is thrown horizontally with an initial velocity of 9 meters per second, experiencing an initial air resistance of 59.9 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 8 seconds.

Version 2031

A mass of 2 kg is thrown horizontally with an initial velocity of 2 meters per second, experiencing an initial air resistance of 0.560 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 7 seconds.

Version 2032

A mass of 8 kg is thrown horizontally with an initial velocity of 6 meters per second, experiencing an initial air resistance of 26.6 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Version 2033

A mass of 6 kg is thrown horizontally with an initial velocity of 7 meters per second, experiencing an initial air resistance of 22.5 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 8 seconds.

Version 2034

A mass of 7 kg is thrown horizontally with an initial velocity of 9 meters per second, experiencing an initial air resistance of 47.8 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 8 seconds.

Version 2035

A mass of 9 kg is thrown horizontally with an initial velocity of 8 meters per second, experiencing an initial air resistance of 58.2 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Version 2036

A mass of 9 kg is thrown horizontally with an initial velocity of 6 meters per second, experiencing an initial air resistance of 32.8 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 3 seconds.

Version 2037

A mass of 8 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 11.8 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Version 2038

A mass of 5 kg is thrown horizontally with an initial velocity of 5 meters per second, experiencing an initial air resistance of 8.75 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 8 seconds.

Version 2039

A mass of 6 kg is thrown horizontally with an initial velocity of 2 meters per second, experiencing an initial air resistance of 1.84 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 5 seconds.

Version 2040

A mass of 6 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 7.36 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 9 seconds.

Version 2041

A mass of 6 kg is thrown horizontally with an initial velocity of 8 meters per second, experiencing an initial air resistance of 29.4 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 6 seconds.

Version 2042

A mass of 4 kg is thrown horizontally with an initial velocity of 9 meters per second, experiencing an initial air resistance of 21.1 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Version 2043

A mass of 3 kg is thrown horizontally with an initial velocity of 3 meters per second, experiencing an initial air resistance of 1.71 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 9 seconds.

Version 2044

A mass of 6 kg is thrown horizontally with an initial velocity of 5 meters per second, experiencing an initial air resistance of 11.5 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 4 seconds.

Version 2045

A mass of 9 kg is thrown horizontally with an initial velocity of 2 meters per second, experiencing an initial air resistance of 3.64 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Version 2046

A mass of 7 kg is thrown horizontally with an initial velocity of 2 meters per second, experiencing an initial air resistance of 2.36 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Version 2047

A mass of 8 kg is thrown horizontally with an initial velocity of 6 meters per second, experiencing an initial air resistance of 26.6 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 8 seconds.

Version 2048

A mass of 7 kg is thrown horizontally with an initial velocity of 4 meters per second, experiencing an initial air resistance of 9.44 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 8 seconds.

Version 2049

A mass of 4 kg is thrown horizontally with an initial velocity of 6 meters per second, experiencing an initial air resistance of 9.36 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 3 seconds.

Version 2050

A mass of 6 kg is thrown horizontally with an initial velocity of 5 meters per second, experiencing an initial air resistance of 11.5 Newtons. Assume that acceleration due to gravity is roughly 9.81 m/s^2.

Write an initial value problem (IVP) modeling the horizontal velocity of this mass. Then solve this IVP to compute the mass's horizontal velocity after 2 seconds.

Standard S2m

Version 2001

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 4 N/m, the outer spring has constant 2 N/m. The inner mass is moved 1 meters outwards from its natural position, while the outer mass is moved 11 meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2002

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters outwards from its natural position, while the outer mass is moved $\frac{83}{4}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2003

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant 4 N/m. The inner mass is moved 0 meters outwards from its natural position, while the outer mass is moved 17 meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2004

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 14 N/m, the outer spring has constant 6 N/m. The inner mass is moved 5 meters inwards from its natural position, while the outer mass is moved $\frac{11}{2}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2005

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 10 N/m, the outer spring has constant 12 N/m. The inner mass is moved 1 meters inwards from its natural position, while the outer mass is moved $\frac{59}{6}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2006

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 14 N/m, the outer spring has constant 6 N/m. The inner mass is moved 0 meters outwards from its natural position, while the outer mass is moved $\frac{19}{3}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2007

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 18 N/m, the outer spring has constant 4 N/m. The inner mass is moved 1 meters outwards from its natural position, while the outer mass is moved $\frac{35}{2}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2008

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 5 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters outwards from its natural position, while the outer mass is moved 5 meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2009

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 4 N/m, the outer spring has constant 6 N/m. The inner mass is moved 7 meters inwards from its natural position, while the outer mass is moved 5 meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2010

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 18 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters inwards from its natural position, while the outer mass is moved 10 meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2011

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 3 N/m, the outer spring has constant 2 N/m. The inner mass is moved 5 meters outwards from its natural position, while the outer mass is moved 5 meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2012

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 18 N/m, the outer spring has constant 4 N/m. The inner mass is moved 3 meters outwards from its natural position, while the outer mass is moved $\frac{21}{2}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2013

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 5 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters outwards from its natural position, while the outer mass is moved 5 meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2014

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 4 N/m, the outer spring has constant 2 N/m. The inner mass is moved 4 meters outwards from its natural position, while the outer mass is moved 2 meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2015

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 4 N/m, the outer spring has constant 6 N/m. The inner mass is moved 8 meters inwards from its natural position, while the outer mass is moved $\frac{14}{3}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2016

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 5 N/m, the outer spring has constant 4 N/m. The inner mass is moved 8 meters inwards from its natural position, while the outer mass is moved 7 meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2017

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 5 N/m, the outer spring has constant 6 N/m. The inner mass is moved 7 meters outwards from its natural position, while the outer mass is moved $\frac{1}{3}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2018

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 5 N/m, the outer spring has constant 4 N/m. The inner mass is moved 7 meters outwards from its natural position, while the outer mass is moved $\frac{29}{4}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2019

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 14 N/m, the outer spring has constant

6 N/m. The inner mass is moved 0 meters outwards from its natural position, while the outer mass is moved $\frac{19}{3}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2020

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 18 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters outwards from its natural position, while the outer mass is moved $\frac{43}{2}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2021

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 10 N/m, the outer spring has constant 12 N/m. The inner mass is moved 2 meters outwards from its natural position, while the outer mass is moved $\frac{23}{2}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2022

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 4 N/m, the outer spring has constant 2 N/m. The inner mass is moved 6 meters inwards from its natural position, while the outer mass is moved 3 meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2023

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant 4 N/m. The inner mass is moved 1 meters outwards from its natural position, while the outer mass is moved $\frac{69}{4}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2024

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 4 N/m, the outer spring has constant 2 N/m. The inner mass is moved 10 meters inwards from its natural position, while the outer mass is moved 5 meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2025

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 5 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters inwards from its natural position, while the outer mass is moved $\frac{29}{4}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2026

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 4 N/m, the outer spring has constant 6 N/m. The inner mass is moved 8 meters outwards from its natural position, while the outer mass is moved $\frac{13}{2}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2027

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 5 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters inwards from its natural position, while the outer mass is moved $\frac{17}{2}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2028

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 10 N/m, the outer spring has constant 12 N/m. The inner mass is moved 7 meters inwards from its natural position, while the outer mass is moved $\frac{29}{6}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2029

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 14 N/m, the outer spring has constant 6 N/m. The inner mass is moved 2 meters inwards from its natural position, while the outer mass is moved $\frac{31}{2}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2030

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters inwards from its natural position, while the outer mass is moved $\frac{53}{4}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2031

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 5 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters inwards from its natural position, while the outer mass is moved 5 meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2032

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant 4 N/m. The inner mass is moved 2 meters outwards from its natural position, while the outer mass is moved $\frac{33}{2}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2033

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 5 N/m, the outer spring has constant

6 N/m. The inner mass is moved 0 meters outwards from its natural position, while the outer mass is moved $\frac{13}{3}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2034

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 10 N/m, the outer spring has constant 12 N/m. The inner mass is moved 2 meters inwards from its natural position, while the outer mass is moved $\frac{67}{6}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2035

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 18 N/m, the outer spring has constant 4 N/m. The inner mass is moved 6 meters inwards from its natural position, while the outer mass is moved 6 meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2036

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 5 N/m, the outer spring has constant 4 N/m. The inner mass is moved 6 meters outwards from its natural position, while the outer mass is moved $\frac{15}{2}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2037

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 4 N/m, the outer spring has constant 6 N/m. The inner mass is moved 8 meters outwards from its natural position, while the outer mass is moved $\frac{17}{6}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2038

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant 4 N/m. The inner mass is moved 0 meters outwards from its natural position, while the outer mass is moved $\frac{85}{4}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2039

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant 4 N/m. The inner mass is moved 7 meters outwards from its natural position, while the outer mass is moved 11 meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2040

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 4 N/m, the outer spring has constant 6 N/m. The inner mass is moved 1 meters inwards from its natural position, while the outer mass is moved $\frac{31}{6}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2041

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 4 N/m, the outer spring has constant 6 N/m. The inner mass is moved 6 meters outwards from its natural position, while the outer mass is moved $\frac{5}{3}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2042

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 10 N/m, the outer spring has constant 12 N/m. The inner mass is moved 7 meters outwards from its natural position, while the outer mass is moved $\frac{29}{6}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2043

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 14 N/m, the outer spring has constant 6 N/m. The inner mass is moved 2 meters outwards from its natural position, while the outer mass is moved $\frac{20}{3}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2044

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant 4 N/m. The inner mass is moved 0 meters outwards from its natural position, while the outer mass is moved $\frac{51}{4}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2045

Consider a coupled mass-spring system where the inner mass is 2 kg, the outer mass is 1 kg, the inner spring has constant 4 N/m, the outer spring has constant 2 N/m. The inner mass is moved 7 meters inwards from its natural position, while the outer mass is moved 2 meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Version 2046

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 14 N/m, the outer spring has constant 6 N/m. The inner mass is moved 3 meters outwards from its natural position, while the outer mass is moved $\frac{41}{6}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2047

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 15 N/m, the outer spring has constant

4 N/m. The inner mass is moved 9 meters outwards from its natural position, while the outer mass is moved $\frac{59}{4}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 2 seconds.

Version 2048

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 4 N/m, the outer spring has constant 6 N/m. The inner mass is moved 6 meters outwards from its natural position, while the outer mass is moved $\frac{16}{3}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 4 seconds.

Version 2049

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 2 kg, the inner spring has constant 14 N/m, the outer spring has constant 6 N/m. The inner mass is moved 7 meters outwards from its natural position, while the outer mass is moved $\frac{23}{2}$ meters outwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 5 seconds.

Version 2050

Consider a coupled mass-spring system where the inner mass is 1 kg, the outer mass is 1 kg, the inner spring has constant 5 N/m, the outer spring has constant 6 N/m. The inner mass is moved 0 meters outwards from its natural position, while the outer mass is moved $\frac{26}{3}$ meters inwards from its natural position. Both masses are then simultaneously released from rest.

Give a system of IVPs that models this scenario, then solve the system. Use your solution to find the position of both masses after 3 seconds.

Standard S4m

Version 2001

Two species, purplegill and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dP}{dt} = -\frac{1}{50}\,MP - \frac{1}{125}\,P^2 + \frac{8}{5}\,P$$

$$\frac{dM}{dt} = -\frac{1}{100}\,M^2 - \frac{3}{250}\,MP + \frac{6}{5}\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 119 purplegill and 21 magentafish, determine the long-term survival of both species.

Version 2002

Two species, bluegill and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{3}{500}\,B^2 - \frac{9}{1000}\,BP + \frac{27}{50}\,B$$

$$\frac{dP}{dt} = -\frac{1}{100}\,BP - \frac{1}{200}\,P^2 + \frac{1}{2}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 58 bluegill and 12 purplegill, determine the long-term survival of both species.

Version 2003

Two species, purplegill and bluegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dP}{dt} = -\frac{9}{1000}\,BP - \frac{3}{500}\,P^2 + \frac{27}{50}\,P$$

$$\frac{dB}{dt} = -\frac{1}{200}\,B^2 - \frac{1}{100}\,BP + \frac{1}{2}\,B$$

Draw an appropriate phase plane. Then, assuming that the current population is 61 purplegill and 11 bluegill, determine the long-term survival of both species.

Version 2004

Two species, greenfish and redfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{1}{125}\,G^2 - \frac{1}{50}\,GR + \frac{8}{5}\,G$$

$$\frac{dR}{dt} = -\frac{3}{250}\,GR - \frac{1}{100}\,R^2 + \frac{6}{5}\,R$$

Draw an appropriate phase plane. Then, assuming that the current population is 119 greenfish and 18 redfish, determine the long-term survival of both species.

Version 2005

Two species, greenfish and redfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{1}{100}\,G^2 - \frac{1}{200}\,GR + \frac{5}{2}\,G$$

$$\frac{dR}{dt} = -\frac{3}{500}\,GR - \frac{9}{1000}\,R^2 + \frac{27}{10}\,R$$

Draw an appropriate phase plane. Then, assuming that the current population is 298 greenfish and 49 redfish, determine the long-term survival of both species.

Version 2006

Two species, greenfish and redfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{3}{250}\,G^2 - \frac{1}{100}\,GR + 6\,G$$

$$\frac{dR}{dt} = -\frac{1}{125}\,GR - \frac{1}{50}\,R^2 + 8\,R$$

Draw an appropriate phase plane. Then, assuming that the current population is 600 greenfish and 98 redfish, determine the long-term survival of both species.

Version 2007

Two species, greenfish and bluegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{1}{100}\,BG - \frac{3}{250}\,G^2 + \frac{12}{5}\,G$$

$$\frac{dB}{dt} = -\frac{1}{50}\,B^2 - \frac{1}{125}\,BG + \frac{16}{5}\,B$$

Draw an appropriate phase plane. Then, assuming that the current population is 241 greenfish and 38 bluegill, determine the long-term survival of both species.

Version 2008

Two species, redfish and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dR}{dt} = -\frac{1}{100}\,MR - \frac{3}{250}\,R^2 + \frac{12}{5}\,R$$

$$\frac{dM}{dt} = -\frac{1}{50}\,M^2 - \frac{1}{125}\,MR + \frac{16}{5}\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 241 redfish and 41 magentafish, determine the long-term survival of both species.

Version 2009

Two species, greenfish and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{1}{100}\,G^2 - \frac{1}{200}\,GP + \frac{5}{2}\,G$$

$$\frac{dP}{dt} = -\frac{3}{500}\,GP - \frac{9}{1000}\,P^2 + \frac{27}{10}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 298 greenfish and 51 purplegill, determine the long-term survival of both species.

Version 2010

Two species, bluegill and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{1}{125}\,B^2 - \frac{1}{50}\,BP + 8\,B$$

$$\frac{dP}{dt} = -\frac{3}{250}\,BP - \frac{1}{100}\,P^2 + 6\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 601 bluegill and 101 purplegill, determine the long-term survival of both species.

Version 2011

Two species, greenfish and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{1}{125}\,G^2 - \frac{1}{50}\,GM + 8\,G$$

$$\frac{dM}{dt} = -\frac{3}{250}\,GM - \frac{1}{100}\,M^2 + 6\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 601 greenfish and 100 magentafish, determine the long-term survival of both species.

Version 2012

Two species, magentafish and greenfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{1}{100}\,GM - \frac{3}{250}\,M^2 + \frac{6}{5}\,M$$

$$\frac{dG}{dt} = -\frac{1}{50}\,G^2 - \frac{1}{125}\,GM + \frac{8}{5}\,G$$

Draw an appropriate phase plane. Then, assuming that the current population is 122 magentafish and 21 greenfish, determine the long-term survival of both species.

Version 2013

Two species, redfish and greenfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dR}{dt} = -\frac{3}{250}\,GR - \frac{3}{500}\,R^2 + \frac{18}{25}\,R$$

$$\frac{dG}{dt} = -\frac{1}{250}\,G^2 - \frac{1}{100}\,GR + \frac{2}{5}\,G$$

Draw an appropriate phase plane. Then, assuming that the current population is 49 redfish and 20 greenfish, determine the long-term survival of both species.

Version 2014

Two species, magentafish and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{3}{250}\,M^2 - \frac{1}{100}\,MP + \frac{6}{5}\,M$$

$$\frac{dP}{dt} = -\frac{1}{125}\,MP - \frac{1}{50}\,P^2 + \frac{8}{5}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 122 magentafish and 20 purplegill, determine the long-term survival of both species.

Version 2015

Two species, magentafish and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{3}{500}\,M^2 - \frac{3}{250}\,MP + \frac{18}{5}\,M$$

$$\frac{dP}{dt} = -\frac{1}{100}\,MP - \frac{1}{250}\,P^2 + 2\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 248 magentafish and 98 purplegill, determine the long-term survival of both species.

Version 2016

Two species, purplegill and yellowgill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dP}{dt} = -\frac{1}{100}\,P^2 - \frac{1}{250}\,PY + 2\,P$$

$$\frac{dY}{dt} = -\frac{3}{500}\,PY - \frac{3}{250}\,Y^2 + \frac{18}{5}\,Y$$

Draw an appropriate phase plane. Then, assuming that the current population is 252 purplegill and 101 yellowgill, determine the long-term survival of both species.

Version 2017

Two species, yellowgill and redfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dY}{dt} = -\frac{1}{200}\,RY - \frac{1}{100}\,Y^2 + Y$$

$$\frac{dR}{dt} = -\frac{9}{1000}\,R^2 - \frac{3}{500}\,RY + \frac{27}{25}\,R$$

Draw an appropriate phase plane. Then, assuming that the current population is 121 yellowgill and 18 redfish, determine the long-term survival of both species.

Version 2018

Two species, purplegill and yellowgill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dP}{dt} = -\frac{1}{100}\,P^2 - \frac{1}{250}\,PY + 2\,P$$

$$\frac{dY}{dt} = -\frac{3}{500}\,PY - \frac{3}{250}\,Y^2 + \frac{18}{5}\,Y$$

Draw an appropriate phase plane. Then, assuming that the current population is 248 purplegill and 100 yellowgill, determine the long-term survival of both species.

Version 2019

Two species, redfish and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dR}{dt} = -\frac{9}{1000}\,PR - \frac{3}{500}\,R^2 + \frac{27}{50}\,R$$

$$\frac{dP}{dt} = -\frac{1}{200}\,P^2 - \frac{1}{100}\,PR + \frac{1}{2}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 60 redfish and 9 purplegill, determine the long-term survival of both species.

Version 2020

Two species, redfish and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dR}{dt} = -\frac{3}{250}\,MR - \frac{3}{500}\,R^2 + \frac{36}{25}\,R$$

$$\frac{dM}{dt} = -\frac{1}{250}\,M^2 - \frac{1}{100}\,MR + \frac{4}{5}\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 100 redfish and 39 magentafish, determine the long-term survival of both species.

Version 2021

Two species, magentafish and yellowgill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{1}{100}\,M^2 - \frac{1}{250}\,MY + \frac{4}{5}\,M$$

$$\frac{dY}{dt} = -\frac{3}{500}\,MY - \frac{3}{250}\,Y^2 + \frac{36}{25}\,Y$$

Draw an appropriate phase plane. Then, assuming that the current population is 101 magentafish and 42 yellowgill, determine the long-term survival of both species.

Version 2022

Two species, greenfish and bluegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{3}{250}\,BG - \frac{3}{500}\,G^2 + \frac{36}{25}\,G$$

$$\frac{dB}{dt} = -\frac{1}{250}\,B^2 - \frac{1}{100}\,BG + \frac{4}{5}\,B$$

Draw an appropriate phase plane. Then, assuming that the current population is 99 greenfish and 40 bluegill, determine the long-term survival of both species.

Version 2023

Two species, bluegill and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{1}{100}\,B^2 - \frac{1}{250}\,BP + \frac{2}{5}\,B$$

$$\frac{dP}{dt} = -\frac{3}{500}\,BP - \frac{3}{250}\,P^2 + \frac{18}{25}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 49 bluegill and 18 purplegill, determine the long-term survival of both species.

Version 2024

Two species, redfish and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dR}{dt} = -\frac{1}{250}\,PR - \frac{1}{100}\,R^2 + 2\,R$$

$$\frac{dP}{dt} = -\frac{3}{250}\,P^2 - \frac{3}{500}\,PR + \frac{18}{5}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 251 redfish and 98 purplegill, determine the long-term survival of both species.

Version 2025

Two species, purplegill and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dP}{dt} = -\frac{1}{200}\,MP - \frac{1}{100}\,P^2 + \frac{5}{2}\,P$$

$$\frac{dM}{dt} = -\frac{9}{1000}\,M^2 - \frac{3}{500}\,MP + \frac{27}{10}\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 301 purplegill and 50 magentafish, determine the long-term survival of both species.

Version 2026

Two species, redfish and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dR}{dt} = -\frac{9}{1000}\,PR - \frac{3}{500}\,R^2 + \frac{27}{10}\,R$$

$$\frac{dP}{dt} = -\frac{1}{200}\,P^2 - \frac{1}{100}\,PR + \frac{5}{2}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 298 redfish and 51 purplegill, determine the long-term survival of both species.

Version 2027

Two species, bluegill and redfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{1}{100}\,B^2 - \frac{1}{250}\,BR + \frac{2}{5}\,B$$

$$\frac{dR}{dt} = -\frac{3}{500}\,BR - \frac{3}{250}\,R^2 + \frac{18}{25}\,R$$

Draw an appropriate phase plane. Then, assuming that the current population is 49 bluegill and 22 redfish, determine the long-term survival of both species.

Version 2028

Two species, magentafish and greenfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{3}{250}\,GM - \frac{3}{500}\,M^2 + \frac{18}{25}\,M$$

$$\frac{dG}{dt} = -\frac{1}{250}\,G^2 - \frac{1}{100}\,GM + \frac{2}{5}\,G$$

Draw an appropriate phase plane. Then, assuming that the current population is 49 magentafish and 21 greenfish, determine the long-term survival of both species.

Version 2029

Two species, purplegill and yellowgill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dP}{dt} = -\frac{3}{500}\,P^2 - \frac{3}{250}\,PY + \frac{36}{25}\,P$$

$$\frac{dY}{dt} = -\frac{1}{100}\,PY - \frac{1}{250}\,Y^2 + \frac{4}{5}\,Y$$

Draw an appropriate phase plane. Then, assuming that the current population is 99 purplegill and 39 yellowgill, determine the long-term survival of both species.

Version 2030

Two species, yellowgill and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dY}{dt} = -\frac{1}{100}\,MY - \frac{3}{250}\,Y^2 + 6\,Y$$

$$\frac{dM}{dt} = -\frac{1}{50}\,M^2 - \frac{1}{125}\,MY + 8\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 598 yellowgill and 98 magentafish, determine the long-term survival of both species.

Version 2031

Two species, yellowgill and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dY}{dt} = -\frac{1}{250}\,PY - \frac{1}{100}\,Y^2 + \frac{2}{5}\,Y$$

$$\frac{dP}{dt} = -\frac{3}{250}\,P^2 - \frac{3}{500}\,PY + \frac{18}{25}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 51 yellowgill and 18 purplegill, determine the long-term survival of both species.

Version 2032

Two species, bluegill and yellowgill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{1}{100}\,B^2 - \frac{1}{200}\,BY + \frac{5}{2}\,B$$

$$\frac{dY}{dt} = -\frac{3}{500}\,BY - \frac{9}{1000}\,Y^2 + \frac{27}{10}\,Y$$

Draw an appropriate phase plane. Then, assuming that the current population is 298 bluegill and 50 yellowgill, determine the long-term survival of both species.

Version 2033

Two species, yellowgill and bluegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dY}{dt} = -\frac{3}{250}\,BY - \frac{3}{500}\,Y^2 + \frac{36}{25}\,Y$$

$$\frac{dB}{dt} = -\frac{1}{250}\,B^2 - \frac{1}{100}\,BY + \frac{4}{5}\,B$$

Draw an appropriate phase plane. Then, assuming that the current population is 99 yellowgill and 41 bluegill, determine the long-term survival of both species.

Version 2034

Two species, yellowgill and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dY}{dt} = -\frac{1}{50}\,PY - \frac{1}{125}\,Y^2 + 8\,Y$$

$$\frac{dP}{dt} = -\frac{1}{100}\,P^2 - \frac{3}{250}\,PY + 6\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 601 yellowgill and 98 purplegill, determine the long-term survival of both species.

Version 2035

Two species, bluegill and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{3}{250}\,B^2 - \frac{1}{100}\,BM + 6\,B$$

$$\frac{dM}{dt} = -\frac{1}{125}\,BM - \frac{1}{50}\,M^2 + 8\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 601 bluegill and 100 magentafish, determine the long-term survival of both species.

Version 2036

Two species, bluegill and greenfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{3}{500}\,B^2 - \frac{9}{1000}\,BG + \frac{27}{10}\,B$$

$$\frac{dG}{dt} = -\frac{1}{100}\,BG - \frac{1}{200}\,G^2 + \frac{5}{2}\,G$$

Draw an appropriate phase plane. Then, assuming that the current population is 299 bluegill and 52 greenfish, determine the long-term survival of both species.

Version 2037

Two species, bluegill and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{1}{100}\,B^2 - \frac{1}{200}\,BM + \frac{5}{2}\,B$$

$$\frac{dM}{dt} = -\frac{3}{500}\,BM - \frac{9}{1000}\,M^2 + \frac{27}{10}\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 301 bluegill and 50 magentafish, determine the long-term survival of both species.

Version 2038

Two species, yellowgill and bluegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dY}{dt} = -\frac{9}{1000}\,BY - \frac{3}{500}\,Y^2 + \frac{27}{25}\,Y$$

$$\frac{dB}{dt} = -\frac{1}{200}\,B^2 - \frac{1}{100}\,BY + B$$

Draw an appropriate phase plane. Then, assuming that the current population is 118 yellowgill and 18 bluegill, determine the long-term survival of both species.

Version 2039

Two species, greenfish and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{3}{500}\,G^2 - \frac{9}{1000}\,GM + \frac{27}{25}\,G$$

$$\frac{dM}{dt} = -\frac{1}{100}\,GM - \frac{1}{200}\,M^2 + M$$

Draw an appropriate phase plane. Then, assuming that the current population is 119 greenfish and 19 magentafish, determine the long-term survival of both species.

Version 2040

Two species, magentafish and greenfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{9}{1000}\,GM - \frac{3}{500}\,M^2 + \frac{27}{25}\,M$$

$$\frac{dG}{dt} = -\frac{1}{200}\,G^2 - \frac{1}{100}\,GM + G$$

Draw an appropriate phase plane. Then, assuming that the current population is 119 magentafish and 22 greenfish, determine the long-term survival of both species.

Version 2041

Two species, purplegill and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dP}{dt} = -\frac{3}{250}\,MP - \frac{3}{500}\,P^2 + \frac{36}{25}\,P$$

$$\frac{dM}{dt} = -\frac{1}{250}\,M^2 - \frac{1}{100}\,MP + \frac{4}{5}\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 102 purplegill and 41 magentafish, determine the long-term survival of both species.

Version 2042

Two species, bluegill and purplegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{1}{100}\,B^2 - \frac{1}{250}\,BP + \frac{2}{5}\,B$$

$$\frac{dP}{dt} = -\frac{3}{500}\,BP - \frac{3}{250}\,P^2 + \frac{18}{25}\,P$$

Draw an appropriate phase plane. Then, assuming that the current population is 50 bluegill and 19 purplegill, determine the long-term survival of both species.

Version 2043

Two species, magentafish and yellowgill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{3}{250}\,M^2 - \frac{1}{100}\,MY + \frac{6}{5}\,M$$

$$\frac{dY}{dt} = -\frac{1}{125}\,MY - \frac{1}{50}\,Y^2 + \frac{8}{5}\,Y$$

Draw an appropriate phase plane. Then, assuming that the current population is 122 magentafish and 20 yellowgill, determine the long-term survival of both species.

Version 2044

Two species, greenfish and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dG}{dt} = -\frac{3}{500}\,G^2 - \frac{9}{1000}\,GM + \frac{27}{25}\,G$$

$$\frac{dM}{dt} = -\frac{1}{100}\,GM - \frac{1}{200}\,M^2 + M$$

Draw an appropriate phase plane. Then, assuming that the current population is 118 greenfish and 18 magentafish, determine the long-term survival of both species.

Version 2045

Two species, bluegill and magentafish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{3}{500}\,B^2 - \frac{9}{1000}\,BM + \frac{27}{10}\,B$$

$$\frac{dM}{dt} = -\frac{1}{100}\,BM - \frac{1}{200}\,M^2 + \frac{5}{2}\,M$$

Draw an appropriate phase plane. Then, assuming that the current population is 299 bluegill and 52 magentafish, determine the long-term survival of both species.

Version 2046

Two species, bluegill and yellowgill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{3}{500}\,B^2 - \frac{3}{250}\,BY + \frac{18}{5}\,B$$

$$\frac{dY}{dt} = -\frac{1}{100}\,BY - \frac{1}{250}\,Y^2 + 2\,Y$$

Draw an appropriate phase plane. Then, assuming that the current population is 251 bluegill and 98 yellowgill, determine the long-term survival of both species.

Version 2047

Two species, magentafish and yellowgill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{3}{250}\,M^2 - \frac{1}{100}\,MY + 6\,M$$

$$\frac{dY}{dt} = -\frac{1}{125}\,MY - \frac{1}{50}\,Y^2 + 8\,Y$$

Draw an appropriate phase plane. Then, assuming that the current population is 601 magentafish and 101 yellowgill, determine the long-term survival of both species.

Version 2048

Two species, magentafish and bluegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dM}{dt} = -\frac{1}{250}\,BM - \frac{1}{100}\,M^2 + 2\,M$$

$$\frac{dB}{dt} = -\frac{3}{250}\,B^2 - \frac{3}{500}\,BM + \frac{18}{5}\,B$$

Draw an appropriate phase plane. Then, assuming that the current population is 250 magentafish and 102 bluegill, determine the long-term survival of both species.

Version 2049

Two species, redfish and bluegill, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dR}{dt} = -\frac{1}{50}\,BR - \frac{1}{125}\,R^2 + \frac{16}{5}\,R$$

$$\frac{dB}{dt} = -\frac{1}{100}\,B^2 - \frac{3}{250}\,BR + \frac{12}{5}\,B$$

Draw an appropriate phase plane. Then, assuming that the current population is 240 redfish and 41 bluegill, determine the long-term survival of both species.

Version 2050

Two species, bluegill and redfish, compete for the same resources. Suppose their populations satisfy the following system of ODEs:

$$\frac{dB}{dt} = -\frac{3}{250}\,B^2 - \frac{1}{100}\,BR + \frac{12}{5}\,B$$

$$\frac{dR}{dt} = -\frac{1}{125}\,BR - \frac{1}{50}\,R^2 + \frac{16}{5}\,R$$

Draw an appropriate phase plane. Then, assuming that the current population is 239 bluegill and 39 redfish, determine the long-term survival of both species.

Standard N3m

Version 2001

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(0.60)$ and $y(0.60)$ given the following system of IVPs.

$$x' = -2\,ty^2 - xy^2 + 3 \qquad x(0) = 2$$

$$y' = t^2y + 2\,xy - 1 \qquad y(0) = -2$$

Version 2002

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(2.6)$ and $y(2.6)$ given the following system of IVPs.

$$x' = -tx^2 - t^2y - 3 \qquad x(2) = 2$$

$$y' = x^2y^2 + ty + 2 \qquad y(2) = -2$$

Version 2003

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(0.60)$ and $y(0.60)$ given the following system of IVPs.

$$x' = 3\,t^2y^2 + 3\,xy + 3 \qquad x(0) = 0$$

$$y' = ty^2 - 4\,xy + 1 \qquad y(0) = 0$$

Version 2004

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = -2\,ty + 4\,xy - 1 \qquad x(0) = 0$$

$$y' = tx - 2\,ty + 3 \qquad y(0) = 1$$

Version 2005

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(-1.4)$ and $y(-1.4)$ given the following system of IVPs.

$$x' = -2\,x^2y - 2\,ty \qquad x(-2) = -1$$

$$y' = 2\,x^2y - 4\,ty - 3 \qquad y(-2) = 1$$

Version 2006

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = x^2y^2 - 2\,ty - 3 \qquad x(-1) = -2$$

$$y' = 2\,t^2x^2 - 2\,ty + 2 \qquad y(-1) = -2$$

Version 2007

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(2.3)$ and $y(2.3)$ given the following system of IVPs.

$$x' = -3\,tx^2 - 4\,xy^2 - 1 \qquad x(2) = -1$$

$$y' = 4\,t^2y^2 - 3\,tx^2 - 3 \qquad y(2) = 0$$

Version 2008

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(1.6)$ and $y(1.6)$ given the following system of IVPs.

$$x' = -3\,t^2y^2 + tx + 3 \qquad x(1) = 0$$

$$y' = -2\,x^2y + 3\,ty^2 - 3 \qquad y(1) = -2$$

Version 2009

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(-1.4)$ and $y(-1.4)$ given the following system of IVPs.

$$x' = 2\,ty - 3\,xy + 1 \qquad x(-2) = -2$$

$$y' = -t^2x + xy + 3 \qquad y(-2) = 1$$

Version 2010

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(2.6)$ and $y(2.6)$ given the following system of IVPs.

$$x' = t^2y^2 - 3\,t^2x \qquad x(2) = 2$$

$$y' = -3\,t^2x + t^2y + 3 \qquad y(2) = 1$$

Version 2011

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(0.60)$ and $y(0.60)$ given the following system of IVPs.

$$x' = 3\,t^2x + 2\,t^2y - 1 \qquad x(0) = -1$$

$$y' = -2\,t^2y^2 + 2\,tx + 2 \qquad y(0) = 2$$

Version 2012

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = -t^2y - 3\,xy^2 + 3 \qquad x(-1) = -1$$

$$y' = -tx^2 - 3\,t^2y + 1 \qquad y(-1) = 2$$

Version 2013

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(1.6)$ and $y(1.6)$ given the following system of IVPs.

$$x' = x^2y - ty^2 - 1 \qquad x(1) = 1$$

$$y' = 2\,t^2y + 3\,xy^2 - 2 \qquad y(1) = 0$$

Version 2014

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-1.7)$ and $y(-1.7)$ given the following system of IVPs.

$$x' = 3\,t^2x - 4\,xy \qquad x(-2) = -1$$

$$y' = 2\,x^2y - tx - 3 \qquad y(-2) = 2$$

Version 2015

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = 3\,x^2y + 3\,ty^2 \qquad x(0) = 0$$

$$y' = -t^2y^2 - 3\,xy + 2 \qquad y(0) = 0$$

Version 2016

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(2.6)$ and $y(2.6)$ given the following system of IVPs.

$$x' = -t^2x^2 - 2\,ty^2 + 2 \qquad x(2) = 0$$

$$y' = 2\,t^2x - 2\,t^2y + 1 \qquad y(2) = -1$$

Version 2017

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(0.60)$ and $y(0.60)$ given the following system of IVPs.

$$x' = t^2x + ty - 3 \qquad x(0) = -1$$

$$y' = x^2y^2 + 2\,t^2y - 3 \qquad y(0) = -1$$

Version 2018

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(0.60)$ and $y(0.60)$ given the following system of IVPs.

$$x' = 3\,t^2y - 2\,x^2y + 3 \qquad x(0) = -1$$

$$y' = 2\,x^2y^2 - tx + 1 \qquad y(0) = 1$$

Version 2019

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(0.60)$ and $y(0.60)$ given the following system of IVPs.

$$x' = t^2x^2 - 2\,ty \qquad x(0) = 0$$

$$y' = -2\,t^2x - ty^2 + 3 \qquad y(0) = 1$$

Version 2020

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(2.6)$ and $y(2.6)$ given the following system of IVPs.

$$x' = -3\,tx^2 + xy^2 + 3 \qquad x(2) = 1$$

$$y' = -4\,xy^2 - 3\,tx \qquad y(2) = 2$$

Version 2021

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = -x^2y^2 - 2\,t^2x + 3 \qquad x(0) = 2$$

$$y' = 4\,t^2y^2 + 4\,x^2y^2 \qquad y(0) = 1$$

Version 2022

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = -2\,t^2y^2 + 4\,tx - 2 \qquad x(0) = -1$$

$$y' = -x^2y^2 - 3\,tx + 2 \qquad y(0) = 1$$

Version 2023

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = -x^2y^2 + ty^2 + 3 \qquad x(-1) = -1$$

$$y' = x^2y^2 + tx - 3 \qquad y(-1) = -1$$

Version 2024

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(1.3)$ and $y(1.3)$ given the following system of IVPs.

$$x' = 4\,t^2y - x^2y - 1 \qquad x(1) = 0$$

$$y' = 2\,t^2x + ty^2 + 1 \qquad y(1) = 0$$

Version 2025

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(1.6)$ and $y(1.6)$ given the following system of IVPs.

$$x' = 4\,t^2y + tx + 3 \qquad x(1) = 0$$

$$y' = ty^2 - 2\,tx + 1 \qquad y(1) = -1$$

Version 2026

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = 4\,tx^2 + 4\,t^2y - 3 \qquad x(-1) = 2$$

$$y' = 2\,t^2x^2 + 3\,t^2y^2 - 1 \qquad y(-1) = 1$$

Version 2027

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = -2\,t^2x - ty \qquad x(-1) = -1$$

$$y' = 2\,ty - 3\,xy - 1 \qquad y(-1) = 1$$

Version 2028

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = -t^2x + 2\,xy^2 - 1 \qquad x(-1) = 1$$

$$y' = -2\,x^2y^2 + 2\,t^2x - 3 \qquad y(-1) = 0$$

Version 2029

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(-1.4)$ and $y(-1.4)$ given the following system of IVPs.

$$x' = -2\,x^2y^2 + 3\,t^2x + 1 \qquad x(-2) = 0$$

$$y' = 2\,tx^2 + ty + 2 \qquad y(-2) = 2$$

Version 2030

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-1.7)$ and $y(-1.7)$ given the following system of IVPs.

$$x' = -3\,t^2y^2 - 4\,tx + 1 \qquad x(-2) = -2$$

$$y' = -2\,xy^2 - tx + 2 \qquad y(-2) = 0$$

Version 2031

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(1.3)$ and $y(1.3)$ given the following system of IVPs.

$$x' = -t^2 y + 4\,x^2 y + 2 \qquad x(1) = -2$$

$$y' = -4\,t^2 y - 4\,xy - 3 \qquad y(1) = 1$$

Version 2032

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(-0.40)$ and $y(-0.40)$ given the following system of IVPs.

$$x' = t^2 x^2 + 2\,ty - 2 \qquad x(-1) = -2$$

$$y' = 3\,x^2 y^2 + tx^2 + 1 \qquad y(-1) = -2$$

Version 2033

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(2.3)$ and $y(2.3)$ given the following system of IVPs.

$$x' = x^2 y - 4\,ty + 2 \qquad x(2) = -2$$

$$y' = -4\,t^2 x + t^2 y - 1 \qquad y(2) = -1$$

Version 2034

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-1.7)$ and $y(-1.7)$ given the following system of IVPs.

$$x' = 4\,x^2 y^2 + 3\,tx^2 - 1 \qquad x(-2) = 1$$

$$y' = 4\,t^2 x^2 + 2\,xy^2 \qquad y(-2) = -1$$

Version 2035

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = ty^2 - 2\,xy - 3 \qquad x(0) = 0$$

$$y' = 3\,t^2 x + t^2 y - 3 \qquad y(0) = -2$$

Version 2036

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(2.3)$ and $y(2.3)$ given the following system of IVPs.

$$x' = -t^2x^2 - 2\,ty - 3 \qquad x(2) = 0$$

$$y' = t^2y^2 - 4\,t^2x \qquad y(2) = -2$$

Version 2037

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = -3\,x^2y - 4\,tx \qquad x(0) = -2$$

$$y' = -3\,t^2y^2 + xy^2 - 2 \qquad y(0) = -2$$

Version 2038

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(2.3)$ and $y(2.3)$ given the following system of IVPs.

$$x' = tx + 4\,xy + 1 \qquad x(2) = 1$$

$$y' = -tx^2 - 4\,x^2y + 2 \qquad y(2) = 2$$

Version 2039

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(2.3)$ and $y(2.3)$ given the following system of IVPs.

$$x' = x^2y - 2\,tx + 3 \qquad x(2) = 2$$

$$y' = -t^2x^2 - 3\,t^2y + 2 \qquad y(2) = 1$$

Version 2040

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(1.6)$ and $y(1.6)$ given the following system of IVPs.

$$x' = 2\,x^2y - 4\,ty + 1 \qquad x(1) = -2$$

$$y' = ty^2 + 3\,xy^2 + 2 \qquad y(1) = 0$$

Version 2041

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = 3\,t^2y^2 + 3\,t^2x + 1 \qquad x(-1) = 0$$

$$y' = -t^2x - t^2y \qquad y(-1) = 0$$

Version 2042

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(0.60)$ and $y(0.60)$ given the following system of IVPs.

$$x' = -4\,x^2y - tx - 1 \qquad x(0) = 2$$

$$y' = -t^2y^2 + 3\,t^2x + 2 \qquad y(0) = 0$$

Version 2043

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = -t^2x + 4\,ty^2 - 3 \qquad x(0) = -2$$

$$y' = 2\,t^2x - t^2y - 1 \qquad y(0) = 2$$

Version 2044

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = 4\,tx^2 - 4\,x^2y \qquad x(-1) = 1$$

$$y' = -t^2y^2 - tx^2 + 3 \qquad y(-1) = 0$$

Version 2045

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(-0.40)$ and $y(-0.40)$ given the following system of IVPs.

$$x' = -4\,t^2x + 2\,xy + 1 \qquad x(-1) = 1$$

$$y' = -2\,t^2x^2 + 4\,ty - 1 \qquad y(-1) = 2$$

Version 2046

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(-0.70)$ and $y(-0.70)$ given the following system of IVPs.

$$x' = ty^2 - 3\,tx + 2 \qquad x(-1) = -2$$

$$y' = 2\,t^2y - 3\,tx + 1 \qquad y(-1) = 2$$

Version 2047

Use technology to implement Euler's method with $h = 0.020$ to approximate $x(0.60)$ and $y(0.60)$ given the following system of IVPs.

$$x' = 4\,t^2y^2 + 4\,tx^2 \qquad x(0) = -2$$

$$y' = -4\,tx^2 - 2\,x^2y + 1 \qquad y(0) = 2$$

Version 2048

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = -2\,t^2x^2 + xy^2 - 2 \qquad x(0) = 0$$

$$y' = 4\,x^2y^2 + 2\,tx - 1 \qquad y(0) = 1$$

Version 2049

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(0.30)$ and $y(0.30)$ given the following system of IVPs.

$$x' = -2\,x^2y + 4\,ty^2 + 3 \qquad x(0) = 2$$

$$y' = 4\,tx^2 + ty^2 + 1 \qquad y(0) = 0$$

Version 2050

Use technology to implement Euler's method with $h = 0.010$ to approximate $x(2.3)$ and $y(2.3)$ given the following system of IVPs.

$$x' = -3\,tx^2 - 4\,x^2y + 3 \qquad x(2) = 0$$

$$y' = -3\,tx + xy \qquad y(2) = 0$$

Standard D3m

Version 2001

A rocket weighing 2700 kg is traveling at a constant 30 meters per second. Then when $t = 40500$, its thrusters are turned on, providing 70 Newtons of force until they are switched off 10800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 56700$.

Version 2002

A rocket weighing 1900 kg is traveling at a constant 50 meters per second. Then when $t = 19000$, its thrusters are turned on, providing 10 Newtons of force until they are switched off 3800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 24700$.

Version 2003

A rocket weighing 4800 kg is traveling at a constant 50 meters per second. Then when $t = 57600$, its thrusters are turned on, providing 60 Newtons of force until they are switched off 14400 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 76800$.

Version 2004

A rocket weighing 500 kg is traveling at a constant 40 meters per second. Then when $t = 9000$, its thrusters are turned on, providing 40 Newtons of force until they are switched off 1000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 11000$.

Version 2005

A rocket weighing 2000 kg is traveling at a constant 170 meters per second. Then when $t = 20000$, its thrusters are turned on, providing 50 Newtons of force until they are switched off 4000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 24000$.

Version 2006

A rocket weighing 2700 kg is traveling at a constant 170 meters per second. Then when $t = 13500$, its thrusters are turned on, providing 50 Newtons of force until they are switched off 8100 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 29700$.

Version 2007

A rocket weighing 1500 kg is traveling at a constant 130 meters per second. Then when $t = 30000$, its thrusters are turned on, providing 50 Newtons of force until they are switched off 3000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 31500$.

Version 2008

A rocket weighing 1400 kg is traveling at a constant 110 meters per second. Then when $t = 26600$, its thrusters are turned on, providing 30 Newtons of force until they are switched off 5600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 28000$.

Version 2009

A rocket weighing 900 kg is traveling at a constant 190 meters per second. Then when $t = 9000$, its thrusters are turned on, providing 50 Newtons of force until they are switched off 2700 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 10800$.

Version 2010

A rocket weighing 500 kg is traveling at a constant 140 meters per second. Then when $t = 9000$, its thrusters are turned on, providing 20 Newtons of force until they are switched off 1500 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 11000$.

Version 2011

A rocket weighing 4900 kg is traveling at a constant 140 meters per second. Then when $t = 83300$, its thrusters are turned on, providing 50 Newtons of force until they are switched off 19600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 122500$.

Version 2012

A rocket weighing 700 kg is traveling at a constant 40 meters per second. Then when $t = 10500$, its thrusters are turned on, providing 100 Newtons of force until they are switched off 2100 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 11900$.

Version 2013

A rocket weighing 3600 kg is traveling at a constant 40 meters per second. Then when $t = 0$, its thrusters are turned on, providing 30 Newtons of force until they are switched off 10800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 14400$.

Version 2014

A rocket weighing 5000 kg is traveling at a constant 20 meters per second. Then when $t = 100000$, its thrusters are turned on, providing 90 Newtons of force until they are switched off 15000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 115000$.

Version 2015

A rocket weighing 1600 kg is traveling at a constant 180 meters per second. Then when $t = 6400$, its thrusters are turned on, providing 100 Newtons of force until they are switched off 4800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 14400$.

Version 2016

A rocket weighing 4200 kg is traveling at a constant 170 meters per second. Then when $t = 16800$, its thrusters are turned on, providing 70 Newtons of force until they are switched off 16800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 21000$.

Version 2017

A rocket weighing 1900 kg is traveling at a constant 100 meters per second. Then when $t = 11400$, its thrusters are turned on, providing 90 Newtons of force until they are switched off 7600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 19000$.

Version 2018

A rocket weighing 3000 kg is traveling at a constant 150 meters per second. Then when $t = 15000$, its thrusters are turned on, providing 60 Newtons of force until they are switched off 12000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 24000$.

Version 2019

A rocket weighing 700 kg is traveling at a constant 30 meters per second. Then when $t = 5600$, its thrusters are turned on, providing 30 Newtons of force until they are switched off 2100 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 9100$.

Version 2020

A rocket weighing 2500 kg is traveling at a constant 110 meters per second. Then when $t = 10000$, its thrusters are turned on, providing 30 Newtons of force until they are switched off 10000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 22500$.

Version 2021

A rocket weighing 1400 kg is traveling at a constant 90 meters per second. Then when $t = 5600$, its thrusters are turned on, providing 90 Newtons of force until they are switched off 5600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 8400$.

Version 2022

A rocket weighing 3400 kg is traveling at a constant 100 meters per second. Then when $t = 20400$, its thrusters are turned on, providing 40 Newtons of force until they are switched off 6800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 34000$.

Version 2023

A rocket weighing 1600 kg is traveling at a constant 30 meters per second. Then when $t = 3200$, its thrusters are turned on, providing 10 Newtons of force until they are switched off 4800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 6400$.

Version 2024

A rocket weighing 1700 kg is traveling at a constant 180 meters per second. Then when $t = 1700$, its thrusters are turned on, providing 30 Newtons of force until they are switched off 5100 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 3400$.

Version 2025

A rocket weighing 3400 kg is traveling at a constant 170 meters per second. Then when $t = 37400$, its thrusters are turned on, providing 70 Newtons of force until they are switched off 13600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 44200$.

Version 2026

A rocket weighing 900 kg is traveling at a constant 170 meters per second. Then when $t = 11700$, its thrusters are turned on, providing 20 Newtons of force until they are switched off 2700 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 15300$.

Version 2027

A rocket weighing 1100 kg is traveling at a constant 30 meters per second. Then when $t = 6600$, its thrusters are turned on, providing 20 Newtons of force until they are switched off 2200 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 7700$.

Version 2028

A rocket weighing 2200 kg is traveling at a constant 10 meters per second. Then when $t = 13200$, its thrusters are turned on, providing 100 Newtons of force until they are switched off 6600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 26400$.

Version 2029

A rocket weighing 2700 kg is traveling at a constant 90 meters per second. Then when $t = 13500$, its thrusters are turned on, providing 60 Newtons of force until they are switched off 10800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 29700$.

Version 2030

A rocket weighing 4600 kg is traveling at a constant 170 meters per second. Then when $t = 92000$, its thrusters are turned on, providing 80 Newtons of force until they are switched off 18400 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 101200$.

Version 2031

A rocket weighing 400 kg is traveling at a constant 20 meters per second. Then when $t = 4000$, its thrusters are turned on, providing 70 Newtons of force until they are switched off 1600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 4400$.

Version 2032

A rocket weighing 3100 kg is traveling at a constant 170 meters per second. Then when $t = 46500$, its thrusters are turned on, providing 20 Newtons of force until they are switched off 6200 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 55800$.

Version 2033

A rocket weighing 3200 kg is traveling at a constant 120 meters per second. Then when $t = 0$, its thrusters are turned on, providing 90 Newtons of force until they are switched off 6400 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 12800$.

Version 2034

A rocket weighing 4800 kg is traveling at a constant 150 meters per second. Then when $t = 91200$, its thrusters are turned on, providing 90 Newtons of force until they are switched off 14400 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 110400$.

Version 2035

A rocket weighing 3900 kg is traveling at a constant 190 meters per second. Then when $t = 58500$, its thrusters are turned on, providing 10 Newtons of force until they are switched off 15600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 74100$.

Version 2036

A rocket weighing 3100 kg is traveling at a constant 200 meters per second. Then when $t = 37200$, its thrusters are turned on, providing 20 Newtons of force until they are switched off 9300 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 52700$.

Version 2037

A rocket weighing 1800 kg is traveling at a constant 160 meters per second. Then when $t = 21600$, its thrusters are turned on, providing 10 Newtons of force until they are switched off 7200 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 27000$.

Version 2038

A rocket weighing 2500 kg is traveling at a constant 100 meters per second. Then when $t = 22500$, its thrusters are turned on, providing 80 Newtons of force until they are switched off 5000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 32500$.

Version 2039

A rocket weighing 100 kg is traveling at a constant 110 meters per second. Then when $t = 900$, its thrusters are turned on, providing 50 Newtons of force until they are switched off 400 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 1400$.

Version 2040

A rocket weighing 1300 kg is traveling at a constant 120 meters per second. Then when $t = 13000$, its thrusters are turned on, providing 100 Newtons of force until they are switched off 3900 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 19500$.

Version 2041

A rocket weighing 3900 kg is traveling at a constant 120 meters per second. Then when $t = 11700$, its thrusters are turned on, providing 60 Newtons of force until they are switched off 15600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 31200$.

Version 2042

A rocket weighing 4600 kg is traveling at a constant 70 meters per second. Then when $t = 4600$, its thrusters are turned on, providing 10 Newtons of force until they are switched off 13800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 9200$.

Version 2043

A rocket weighing 700 kg is traveling at a constant 40 meters per second. Then when $t = 11200$, its thrusters are turned on, providing 90 Newtons of force until they are switched off 2800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 11900$.

Version 2044

A rocket weighing 2400 kg is traveling at a constant 120 meters per second. Then when $t = 28800$, its thrusters are turned on, providing 40 Newtons of force until they are switched off 9600 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 48000$.

Version 2045

A rocket weighing 600 kg is traveling at a constant 200 meters per second. Then when $t = 5400$, its thrusters are turned on, providing 10 Newtons of force until they are switched off 2400 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 9600$.

Version 2046

A rocket weighing 500 kg is traveling at a constant 140 meters per second. Then when $t = 2500$, its thrusters are turned on, providing 10 Newtons of force until they are switched off 2000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 6500$.

Version 2047

A rocket weighing 2700 kg is traveling at a constant 160 meters per second. Then when $t = 48600$, its thrusters are turned on, providing 90 Newtons of force until they are switched off 10800 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 64800$.

Version 2048

A rocket weighing 1700 kg is traveling at a constant 150 meters per second. Then when $t = 5100$, its thrusters are turned on, providing 90 Newtons of force until they are switched off 3400 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 8500$.

Version 2049

A rocket weighing 3000 kg is traveling at a constant 80 meters per second. Then when $t = 57000$, its thrusters are turned on, providing 30 Newtons of force until they are switched off 6000 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 69000$.

Version 2050

A rocket weighing 2200 kg is traveling at a constant 110 meters per second. Then when $t = 35200$, its thrusters are turned on, providing 10 Newtons of force until they are switched off 4400 seconds later.

Give an IVP that models this scenario, then solve it. Use your solution to find the velocity of the rocket when $t = 39600$.

Standard D4m

Version 2001

A 2 kg mass is attached to a spring with constant 18 N/m. The mass is pulled outward 10 meters and released from rest. Then after 8 seconds, the mass is struck by a hammer, imparting 6 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 16$.

Version 2002

A 2 kg mass is attached to a spring with constant 18 N/m. The mass is pulled outward 2 meters and released from rest. Then after 6 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2003

A 2 kg mass is attached to a spring with constant 32 N/m. The mass is pulled outward 7 meters and released from rest. Then after 6 seconds, the mass is struck by a hammer, imparting 6 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2004

A 2 kg mass is attached to a spring with constant 8 N/m. The mass is pulled outward 3 meters and released from rest. Then after 9 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 17$.

Version 2005

A 5 kg mass is attached to a spring with constant 45 N/m. The mass is pulled outward 4 meters and released from rest. Then after 5 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 10$.

Version 2006

A 5 kg mass is attached to a spring with constant 45 N/m. The mass is pulled outward 4 meters and released from rest. Then after 3 seconds, the mass is struck by a hammer, imparting 5 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2007

A 4 kg mass is attached to a spring with constant 16 N/m. The mass is pulled outward 1 meters and released from rest. Then after 10 seconds, the mass is struck by a hammer, imparting 5 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 12$.

Version 2008

A 4 kg mass is attached to a spring with constant 16 N/m. The mass is pulled outward 10 meters and released from rest. Then after 10 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 12$.

Version 2009

A 5 kg mass is attached to a spring with constant 20 N/m. The mass is pulled outward 6 meters and released from rest. Then after 6 seconds, the mass is struck by a hammer, imparting 5 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 9$.

Version 2010

A 4 kg mass is attached to a spring with constant 16 N/m. The mass is pulled outward 6 meters and released from rest. Then after 9 seconds, the mass is struck by a hammer, imparting 3 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 16$.

Version 2011

A 4 kg mass is attached to a spring with constant 64 N/m. The mass is pulled outward 10 meters and released from rest. Then after 9 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 19$.

Version 2012

A 2 kg mass is attached to a spring with constant 8 N/m. The mass is pulled outward 5 meters and released from rest. Then after 8 seconds, the mass is struck by a hammer, imparting 8 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 11$.

Version 2013

A 2 kg mass is attached to a spring with constant 32 N/m. The mass is pulled outward 4 meters and released from rest. Then after 1 seconds, the mass is struck by a hammer, imparting 3 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 7$.

Version 2014

A 2 kg mass is attached to a spring with constant 32 N/m. The mass is pulled outward 6 meters and released from rest. Then after 10 seconds, the mass is struck by a hammer, imparting 7 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 15$.

Version 2015

A 5 kg mass is attached to a spring with constant 20 N/m. The mass is pulled outward 6 meters and released from rest. Then after 3 seconds, the mass is struck by a hammer, imparting 8 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 11$.

Version 2016

A 5 kg mass is attached to a spring with constant 80 N/m. The mass is pulled outward 9 meters and released from rest. Then after 3 seconds, the mass is struck by a hammer, imparting 6 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 4$.

Version 2017

A 3 kg mass is attached to a spring with constant 27 N/m. The mass is pulled outward 9 meters and released from rest. Then after 4 seconds, the mass is struck by a hammer, imparting 7 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 8$.

Version 2018

A 4 kg mass is attached to a spring with constant 36 N/m. The mass is pulled outward 8 meters and released from rest. Then after 3 seconds, the mass is struck by a hammer, imparting 6 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 6$.

Version 2019

A 2 kg mass is attached to a spring with constant 8 N/m. The mass is pulled outward 6 meters and released from rest. Then after 5 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2020

A 4 kg mass is attached to a spring with constant 36 N/m. The mass is pulled outward 9 meters and released from rest. Then after 2 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 8$.

Version 2021

A 3 kg mass is attached to a spring with constant 12 N/m. The mass is pulled outward 9 meters and released from rest. Then after 2 seconds, the mass is struck by a hammer, imparting 8 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 4$.

Version 2022

A 3 kg mass is attached to a spring with constant 48 N/m. The mass is pulled outward 1 meters and released from rest. Then after 4 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 14$.

Version 2023

A 2 kg mass is attached to a spring with constant 8 N/m. The mass is pulled outward 7 meters and released from rest. Then after 2 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 5$.

Version 2024

A 5 kg mass is attached to a spring with constant 20 N/m. The mass is pulled outward 6 meters and released from rest. Then after 1 seconds, the mass is struck by a hammer, imparting 3 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 3$.

Version 2025

A 5 kg mass is attached to a spring with constant 80 N/m. The mass is pulled outward 10 meters and released from rest. Then after 6 seconds, the mass is struck by a hammer, imparting 6 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 8$.

Version 2026

A 5 kg mass is attached to a spring with constant 20 N/m. The mass is pulled outward 6 meters and released from rest. Then after 7 seconds, the mass is struck by a hammer, imparting 3 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2027

A 2 kg mass is attached to a spring with constant 8 N/m. The mass is pulled outward 2 meters and released from rest. Then after 4 seconds, the mass is struck by a hammer, imparting 3 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 6$.

Version 2028

A 2 kg mass is attached to a spring with constant 18 N/m. The mass is pulled outward 4 meters and released from rest. Then after 4 seconds, the mass is struck by a hammer, imparting 8 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 14$.

Version 2029

A 3 kg mass is attached to a spring with constant 27 N/m. The mass is pulled outward 8 meters and released from rest. Then after 3 seconds, the mass is struck by a hammer, imparting 5 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 10$.

Version 2030

A 5 kg mass is attached to a spring with constant 80 N/m. The mass is pulled outward 10 meters and released from rest. Then after 10 seconds, the mass is struck by a hammer, imparting 7 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 12$.

Version 2031

A 2 kg mass is attached to a spring with constant 8 N/m. The mass is pulled outward 8 meters and released from rest. Then after 6 seconds, the mass is struck by a hammer, imparting 6 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 8$.

Version 2032

A 5 kg mass is attached to a spring with constant 45 N/m. The mass is pulled outward 2 meters and released from rest. Then after 8 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 14$.

Version 2033

A 4 kg mass is attached to a spring with constant 36 N/m. The mass is pulled outward 2 meters and released from rest. Then after 1 seconds, the mass is struck by a hammer, imparting 7 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 11$.

Version 2034

A 4 kg mass is attached to a spring with constant 64 N/m. The mass is pulled outward 7 meters and released from rest. Then after 10 seconds, the mass is struck by a hammer, imparting 7 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 16$.

Version 2035

A 5 kg mass is attached to a spring with constant 80 N/m. The mass is pulled outward 9 meters and released from rest. Then after 8 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2036

A 5 kg mass is attached to a spring with constant 45 N/m. The mass is pulled outward 5 meters and released from rest. Then after 6 seconds, the mass is struck by a hammer, imparting 3 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2037

A 5 kg mass is attached to a spring with constant 45 N/m. The mass is pulled outward 10 meters and released from rest. Then after 6 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 9$.

Version 2038

A 3 kg mass is attached to a spring with constant 27 N/m. The mass is pulled outward 1 meters and released from rest. Then after 5 seconds, the mass is struck by a hammer, imparting 7 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 14$.

Version 2039

A 4 kg mass is attached to a spring with constant 16 N/m. The mass is pulled outward 10 meters and released from rest. Then after 5 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 11$.

Version 2040

A 4 kg mass is attached to a spring with constant 16 N/m. The mass is pulled outward 5 meters and released from rest. Then after 5 seconds, the mass is struck by a hammer, imparting 8 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 14$.

Version 2041

A 4 kg mass is attached to a spring with constant 64 N/m. The mass is pulled outward 10 meters and released from rest. Then after 2 seconds, the mass is struck by a hammer, imparting 5 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 9$.

Version 2042

A 3 kg mass is attached to a spring with constant 48 N/m. The mass is pulled outward 6 meters and released from rest. Then after 1 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 2$.

Version 2043

A 2 kg mass is attached to a spring with constant 8 N/m. The mass is pulled outward 8 meters and released from rest. Then after 8 seconds, the mass is struck by a hammer, imparting 8 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 9$.

Version 2044

A 4 kg mass is attached to a spring with constant 36 N/m. The mass is pulled outward 10 meters and released from rest. Then after 7 seconds, the mass is struck by a hammer, imparting 4 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 17$.

Version 2045

A 5 kg mass is attached to a spring with constant 20 N/m. The mass is pulled outward 10 meters and released from rest. Then after 5 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2046

A 4 kg mass is attached to a spring with constant 16 N/m. The mass is pulled outward 8 meters and released from rest. Then after 3 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.

Version 2047

A 5 kg mass is attached to a spring with constant 45 N/m. The mass is pulled outward 10 meters and released from rest. Then after 9 seconds, the mass is struck by a hammer, imparting 7 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 17$.

Version 2048

A 4 kg mass is attached to a spring with constant 36 N/m. The mass is pulled outward 1 meters and released from rest. Then after 2 seconds, the mass is struck by a hammer, imparting 7 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 5$.

Version 2049

A 3 kg mass is attached to a spring with constant 27 N/m. The mass is pulled outward 2 meters and released from rest. Then after 10 seconds, the mass is struck by a hammer, imparting 3 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 20$.

Version 2050

A 4 kg mass is attached to a spring with constant 36 N/m. The mass is pulled outward 3 meters and released from rest. Then after 8 seconds, the mass is struck by a hammer, imparting 2 Newtons of inward impulse.

Give an IVP that models this scenario, then solve it. Use your solution to find the position of the mass when $t = 13$.