Calculus 2 Workbook

Physics

krista king MATH

MOMENTS OF THE SYSTEM

1. Calculate the moments of the system.

$m_1 = 3;\ P_1(2,5)$

$m_2 = 4;\ P_2(-2,6)$

$m_3 = 6;\ P_3(4,-5)$

2. Calculate the moments of the system.

$m_1 = 7;\ P_1(5,2)$

$m_2 = 3;\ P_2(-4,3)$

$m_3 = 5;\ P_3(-3,4)$

3. Calculate the moments of the system.

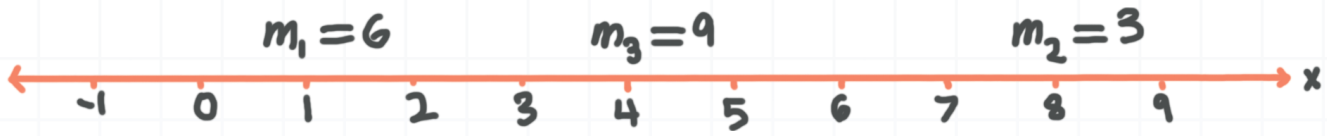
$m_1 = 9;\ P_1(7,5)$

$m_2 = -5;\ P_2(3,8)$

$m_3 = 4;\ P_3(5,4)$

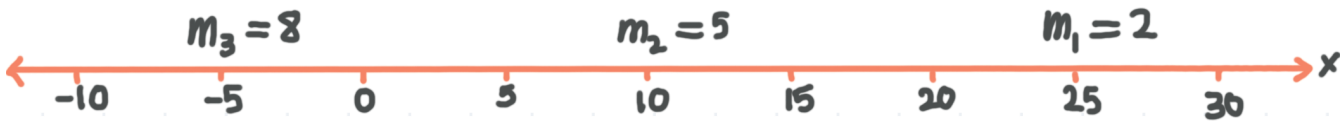
MOMENTS OF THE SYSTEM, X-AXIS

1. Calculate the moments of the system.



2. Calculate the moments of the system.

3. Calculate the moments of the system.



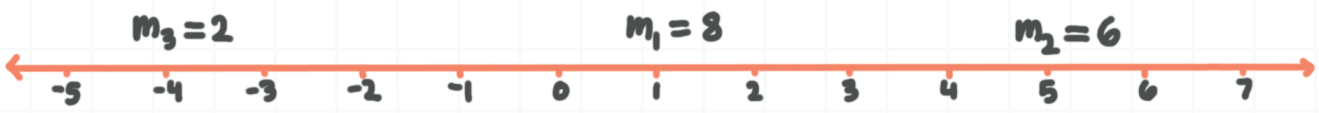
CENTER OF MASS OF THE SYSTEM

1. Find the center of mass of the system if $M_y = 16$ and $M_x = 22$ and the total mass is $m_T = 14$.

2. Find the center of mass of the system if $M_y = 32.5$ and $M_x = 28.5$ and the total mass is $m_T = 7.5$.

CENTER OF MASS OF THE SYSTEM, X-AXIS

1. Find the center of mass of the system.



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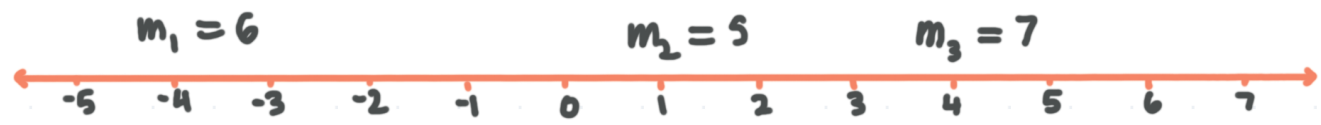
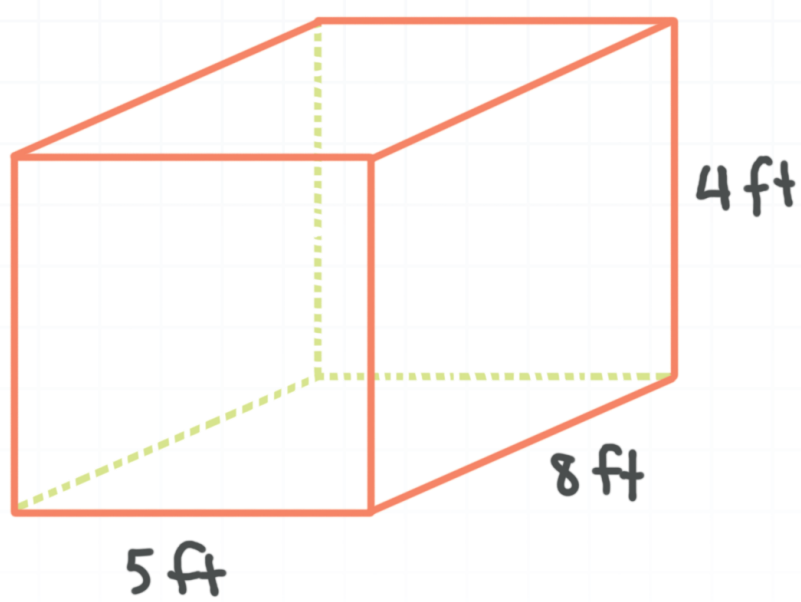
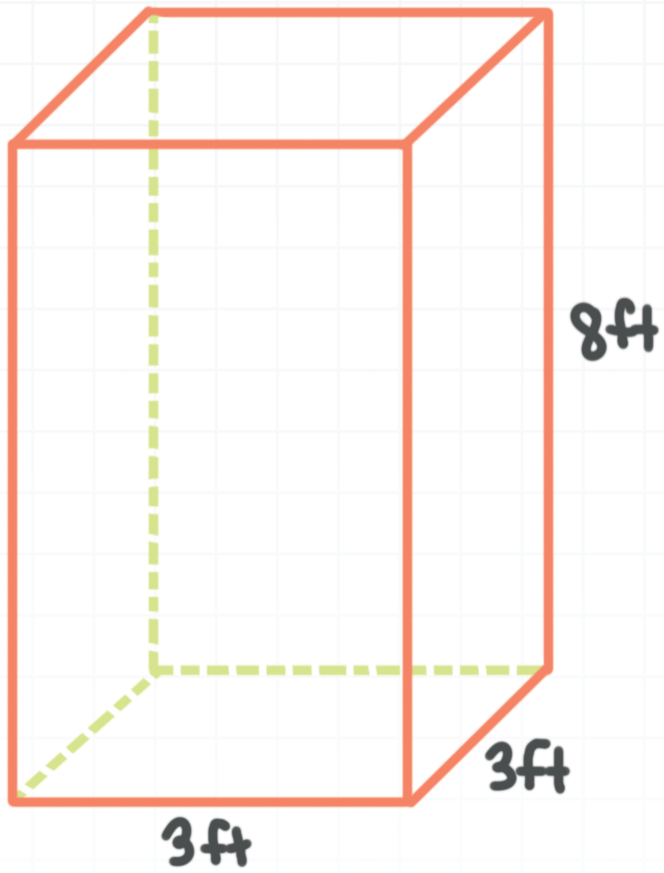


HYDROSTATIC PRESSURE

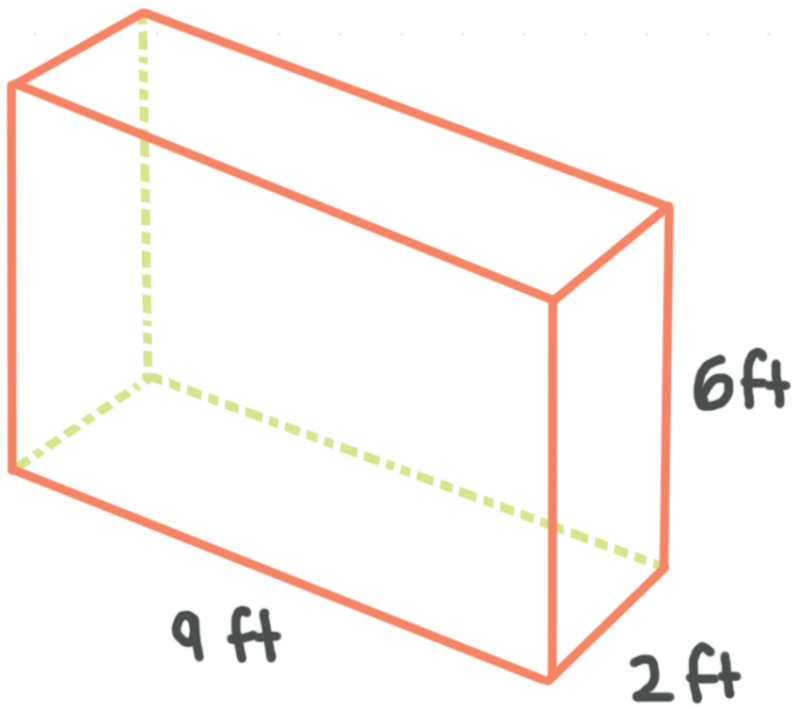
1. Find the hydrostatic pressure per square foot on the bottom of the tank, which is filled to the top with gasoline. Assume the weight of a gallon of gasoline is 6.073 pounds per gallon.



2. Find the hydrostatic pressure per square foot on the bottom of the tank, which is filled to the top with water. Assume the weight of a gallon of water is 8.3454 pounds per gallon.

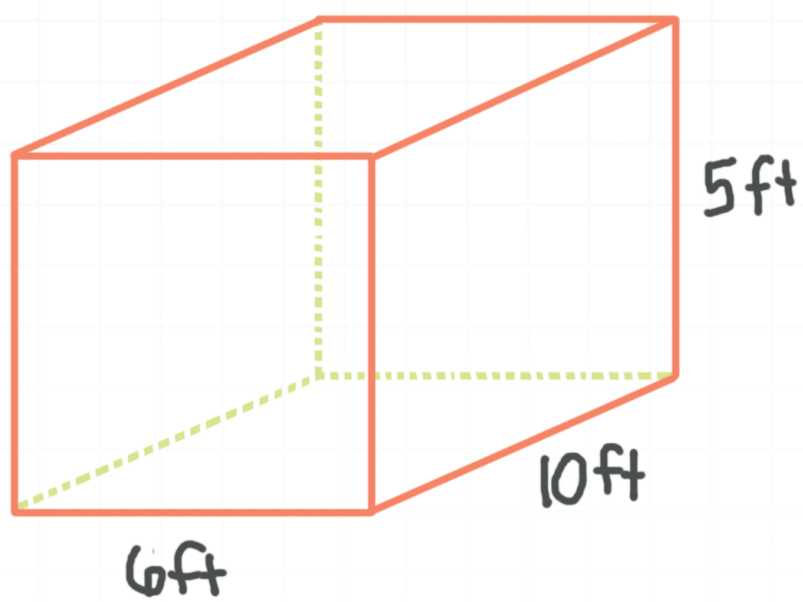


3. Find the hydrostatic pressure per square foot on the bottom of the tank, which is filled to the top with diesel fuel. Assume the weight of a gallon of diesel is 7.1089 pounds per gallon.

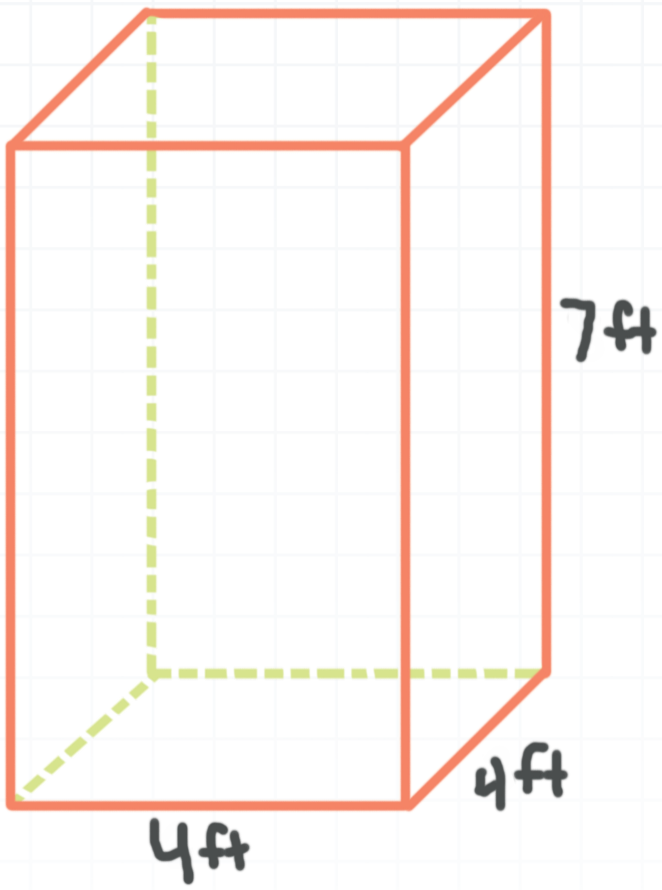


HYDROSTATIC FORCE

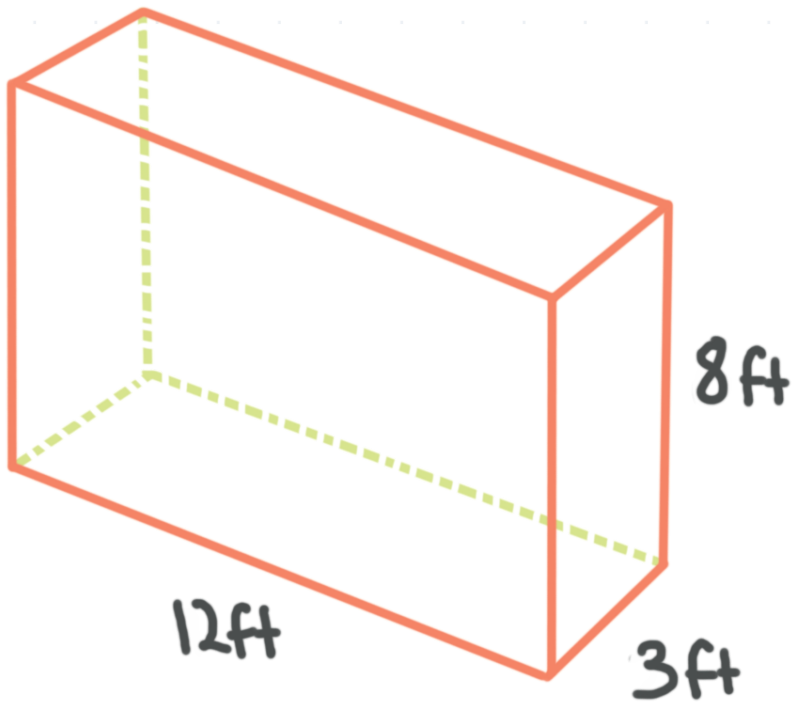
1. Find the hydrostatic force on the bottom of the tank, which is filled to the top with gasoline. Assume the weight of a gallon of gasoline is 6.073 pounds per gallon.



2. Find the hydrostatic force on the bottom of the tank, which is filled to the top with water. Assume the weight of a gallon of water is 8.3454 pounds per gallon.



■ 3. Find the hydrostatic force on the bottom of the tank, which is filled to the top with diesel fuel. Assume the weight of a gallon of diesel is 7.1089 pounds per gallon.



VERTICAL MOTION

■ 1. What is the maximum height of a baseball that's thrown straight up from a position 6 feet above the ground with an initial velocity of $v(t) = -32t + 88$ ft/sec?

■ 2. What is the maximum height of a football that's thrown straight up from 1.67 yards above the ground with an initial velocity of $v(t) = -10.67t + 40$ yards/sec?

■ 3. What is the maximum height of a model rocket that's launched straight up from the ground with an initial velocity of $v(t) = -32t + 200$ ft/sec?

■ 4. What is the maximum height of a bottle rocket that's launched straight up from the ground with an initial velocity of $v(t) = -19.6t + 29.4$ m/sec?

■ 5. What is the maximum height of a golf ball that's hit straight up from the ground with an initial velocity of $v(t) = -19.6t + 68.208$ m/sec?

RECTILINEAR MOTION

■ 1. Find the position function $x(t)$ that models the rectilinear motion of a particle moving along the x-axis.

$$a(t) = 10 - t$$

$$v(0) = -1$$

$$x(0) = 6$$

■ 2. Find the position function $x(t)$ that models the rectilinear motion of a particle moving along the x-axis.

$$a(t) = 9t^2 - 4t + 6$$

$$v(-1) = 0$$

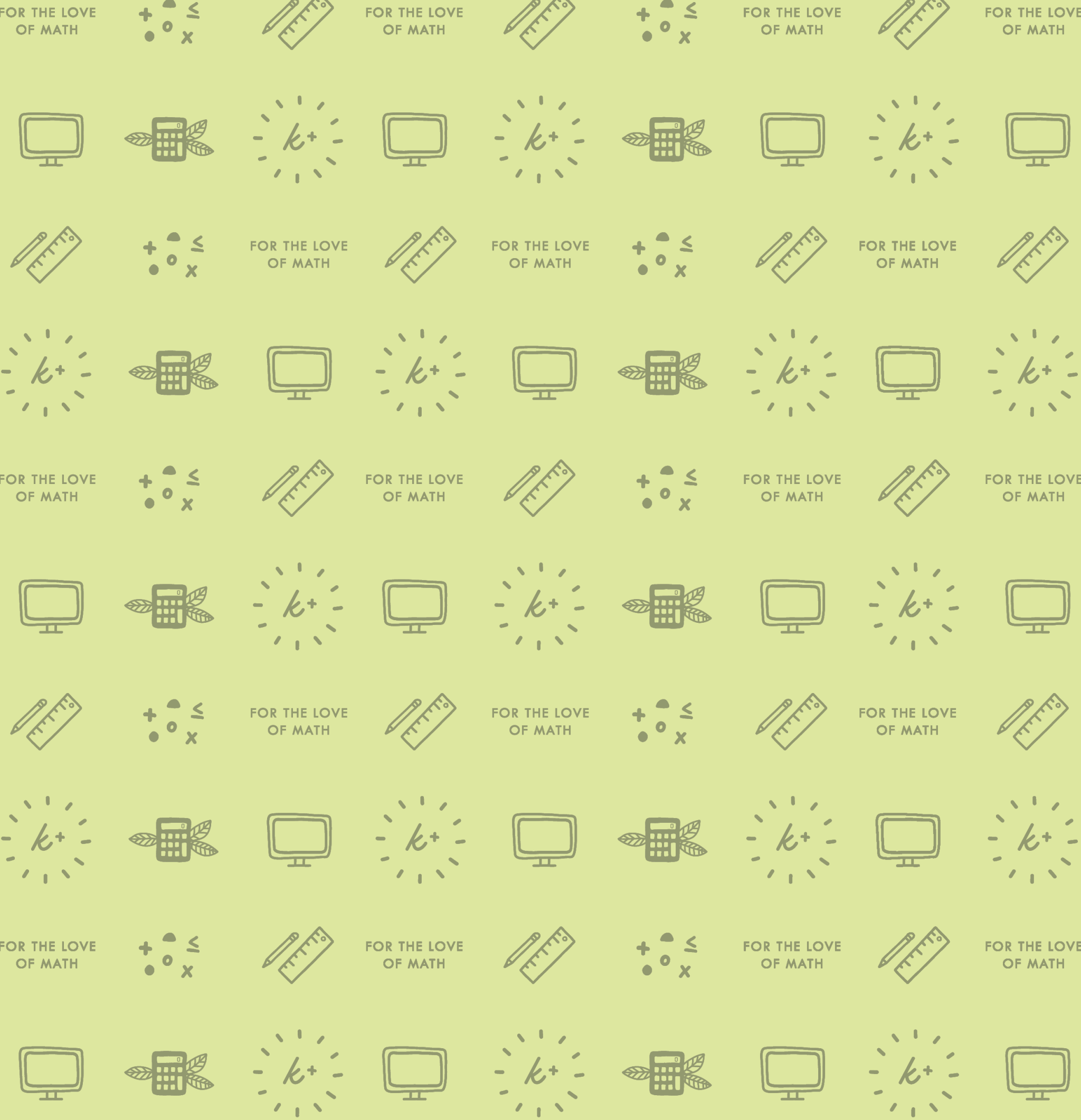
$$x(0) = 2$$

■ 3. Find the position function $x(t)$ that models the rectilinear motion of a particle moving along the x-axis.

$$a(t) = 2 - 6t$$

$$v(0) = 4$$

$$x(0) = 3$$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