Name:_____

For each question (except multiple choice and fill in the blank), your solution must show work/calculations and display/explain your reasoning.
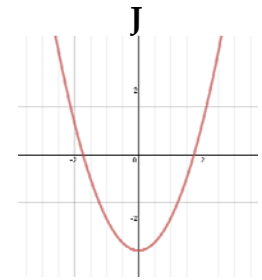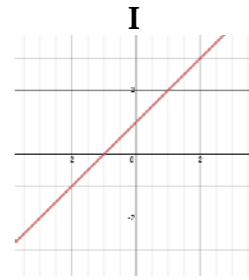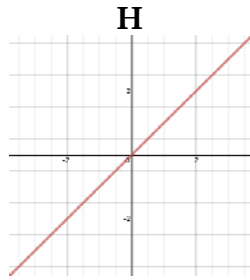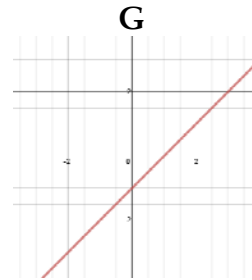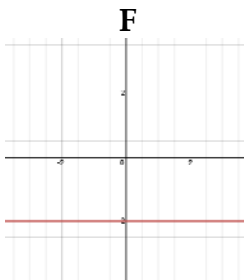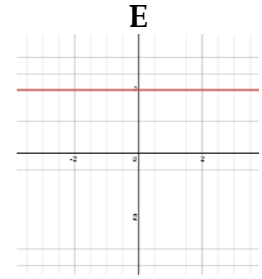
A	B	C	D	E

F	G	H	I	J

1. Consider an object moving with **negative constant acceleration**.

a) Circle the letters of all the graphs above that could represent the **velocity vs. time** for this object.

A   B   C   D   E   F   G   H   I   J   **None of these**

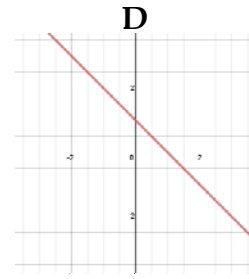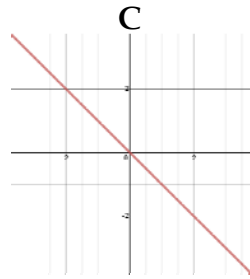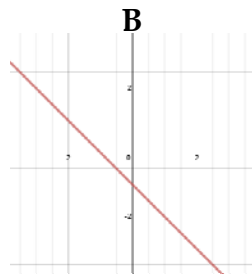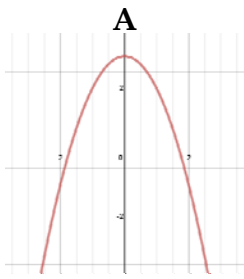b) Circle the letters of all the graphs above that could represent the **position vs. time** for this object.

A   B   C   D   E   F   G   H   I   J   **None of these**

2. A ball is launched straight up in the air starting from the ground, reaches its maximum height, and comes straight down landing back on the ground. Neglect air resistance, and take up to be positive. What directions do the velocity and acceleration of the ball point for the following parts of the ball's trip?

on the way up after being launched:	on the way down before hitting ground:	at the top (maximum height):
velocity is **+ − 0**	velocity is **+ − 0**	velocity is **+ − 0**
acceleration is **+ − 0**	acceleration is **+ − 0**	acceleration is **+ − 0**

3. A bicycle initially traveling at 5 m/s slows down at a constant rate to 3 m/s over a distance of 4 m. What is the bike's acceleration?

4. Find an equation for the quadratic function shown graphed.
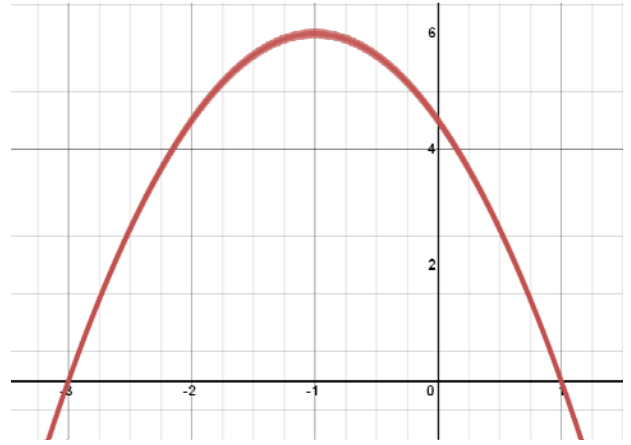
5. On Planet X, a ball launched straight up from ground level with some initial velocity travels straight up and down returning to its starting position, moving with constant downward acceleration while traveling. Neglecting air resistance, its height (in meters) as a function of time (in seconds) between when it is thrown and when it lands is given by:

$$y = -10t^2 + 30t$$

a) Write down the initial velocity and the acceleration of the ball.

initial velocity:	acceleration:

b) Find the vertex of $y = -10t^2 + 30t$.

c) Determine the total travel time (from launch to land) of the ball.

6. A rectangle is drawn so that the width is 4 feet shorter than the length. The area of the rectangle is 60 square feet.
a) Draw a diagram with labels and write some equations that represents this situation.
b) Find the length of the rectangle.