First Name _____ Last Name _____ Date ___ – ___ – ___ Period ____ Score ____

Thoughts of the Day

Exams are not lotteries.

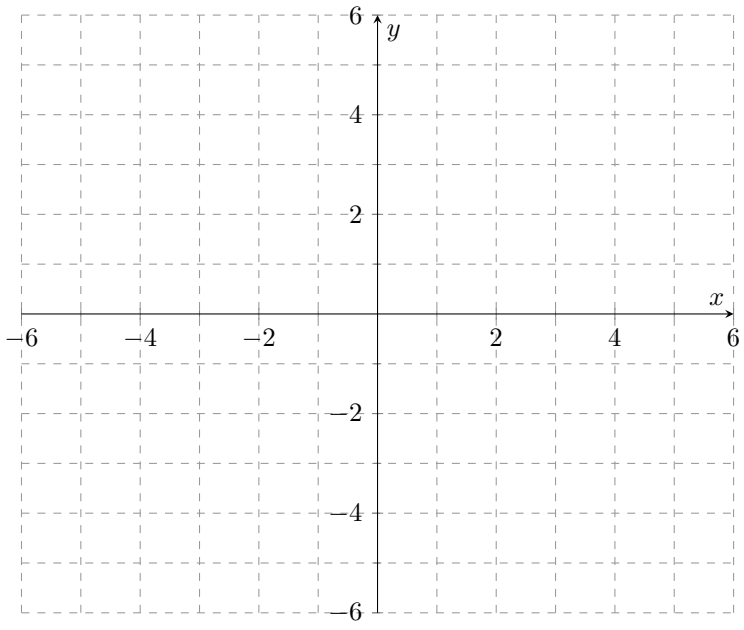
Learning Objectives.

- Use the graph of a business function to make informed business decisions.

Do Now. Let $f(x) = x^2 - x$.

1. Complete the following table.
2. Plot the points in the coordinate frame.
3. Sketch the graph of $f(x)$ on $[-2, 2]$ by tracing the points.

x	$f(x)$
-2	
-1.5	
-1	
-0.5	
0	
0.5	
1	
1.5	
2	

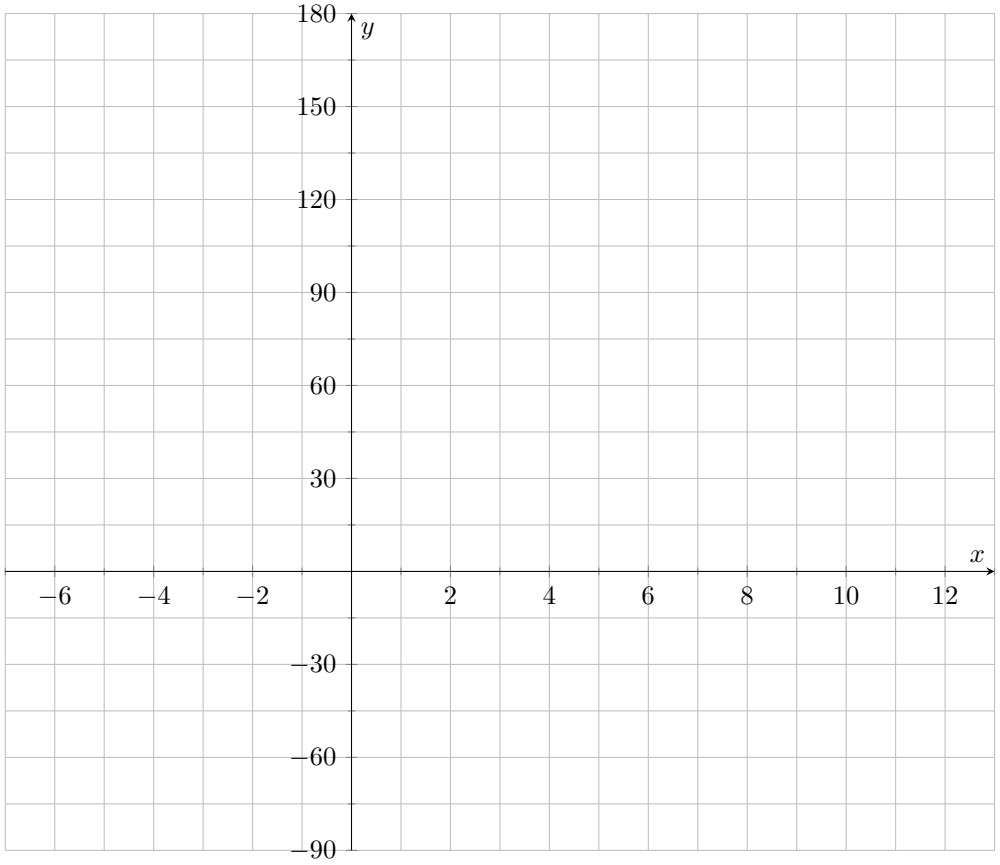


Problems. A manufacturer of sweatshirts finds that profits and costs fluctuate depending on the number of products created. Creating more products doesn't always increase profits because it requires additional costs, such as building a larger facility or hiring more workers. The manufacturer determines the profit, $p(x)$, in thousands of dollars, as a function of the number of sweatshirts sold, x, in thousands. This function, p, is given below.

$$p(x) = -x^3 + 11x^2 - 7x - 69$$

1. $(1, -66)$ is a point on the graph of the function. Interpret the meaning of this set of coordinates in the business language.

2. Graph $y = p(x)$, over the interval $0 \leq x \leq 9$, on the set of axes below.



3. Over the given interval, state the coordinates of the maximum of p and round all values to the nearest integer. Explain what this point represents in terms of the number of sweatshirts sold and profit.

4. Determine how many sweatshirts, to the nearest whole sweatshirt, the manufacturer would need to produce in order to first make a positive profit. Justify your answer.