

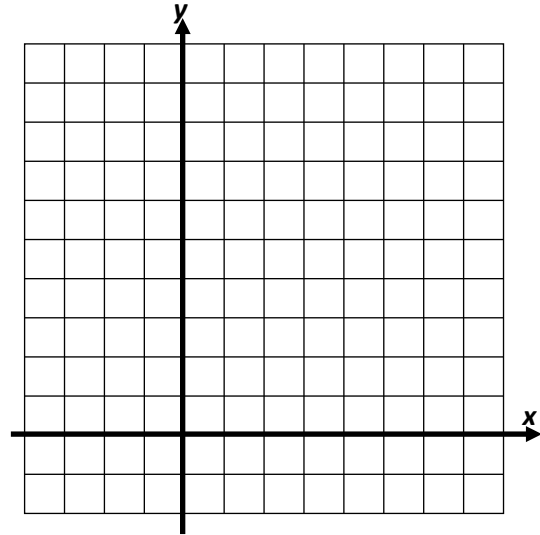
Exploring Functions Using the Graphing Calculator

1. Consider the function $g(x) = 3x^2 + 2x - 4$. Evaluate the following using your graphing calculator.

(a) $g(-2) =$ (b) $g(0) =$ (c) $g(4) =$ (d) $g(15) =$

2. Given the function $f(x) = x^2 - 2x + 1$, fill in the missing values in the table then using the table graph the function on the grid for the interval. Use your calculator.

x	y	(x, y)
-2		
		$(-1, 4)$
0		
	0	
2		
3		
	9	

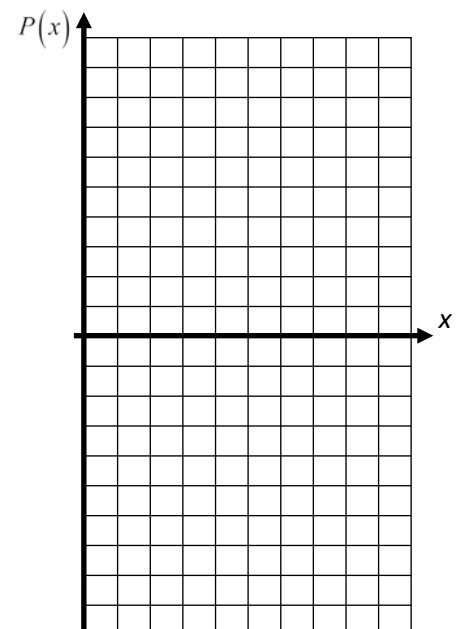


3. Profits for the upcoming year for a shipping company have been quantified and put into the equation

$P(x) = \frac{1}{2}(x-2)^2 - 8$ where x is the number of packages shipped in thousands and $P(x)$ is the corresponding profit in millions of dollars.

(a) Use your calculator to fill out the following table and graph the function on the grid for the interval $0 \leq x \leq 10$.

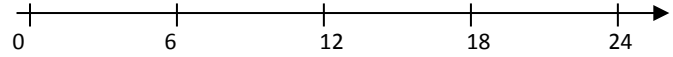
x	$P(x)$	(x, y)
0		
2		
4		
6		
8		
10		



- (b) Over what interval is $P(x) < 0$? What does this interval represent?
- (c) Evaluate $P(0)$. What might this stand for?
- (d) Explore the table to determine the value of x for which $P(x) = 0$. What might this stand for?

R1. A new office-residential building just opened in Lagrangeville and the contractor is monitoring the water use. For the most part, water is used by the office between the hours of 7 AM – 7 PM and the residential section between 12AM – 9 AM or 3PM – 12AM, including the endpoint times.

- (a) Create a compound inequality written in interval notation that represents the hours that both sections (residential and office) are using water at the same time. Graph the solution on the number line given. Assume that 12 AM corresponds to zero and a time such as 3 PM corresponds to 15. As a start, it might help to graph each individual section's water use and see where they overlap.

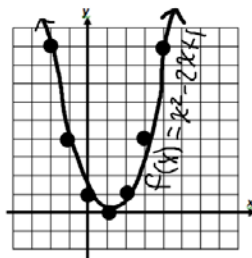


- (b) If the water heater in the building cannot sustain more than 4 hours of use from both parties at the same time, will there be a period of the day that cold water will start to be produced? Explain

1. (a) $g(-2) = 4$
 (b) $g(0) = -4$
 (c) $g(4) = 52$
 (d) $g(15) = 701$

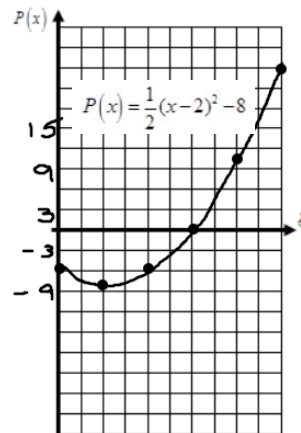
2.

x	y	(x, y)
-2	9	$(-2, 9)$
-1	4	$(-1, 4)$
0	1	$(0, 1)$
1	0	$(1, 0)$
2	1	$(2, 1)$
3	4	$(3, 4)$
4	9	$(4, 9)$



3.

x	$P(x)$	(x, y)
0	-6	$(0, -6)$
2	-8	$(2, -8)$
4	-6	$(4, -6)$
6	0	$(6, 0)$
8	10	$(8, 10)$
10	24	$(10, 24)$



- (b) $0 \leq x < 6$, the company has not yet made a profit
 (c) Start up costs
 (d) When 6000 packages are shipped, the company has made back the amount of money it has spent.

R1a. $[7, 9]$ or $[15, 19]$

R1b. No. $[7, 9]$ represents 2 hours and $[15, 19]$ represents exactly 4 hours, not more.