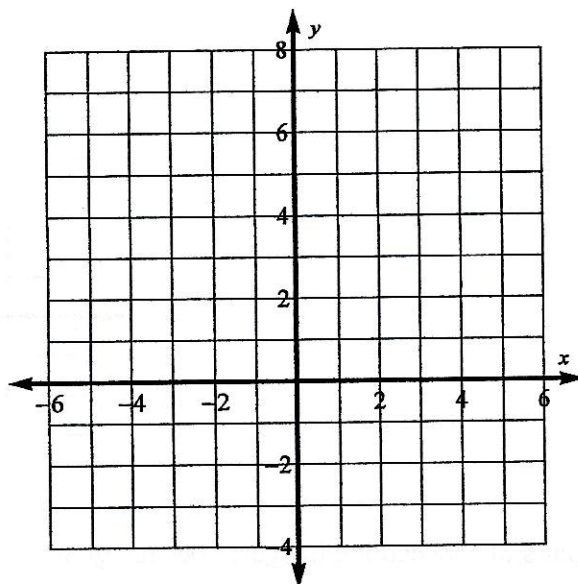


Characteristics of Functions

1. Complete the following questions for the function, $f(x) = 3x + 2$.
- a. Complete the table of values and graph the function on the grid provided.

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

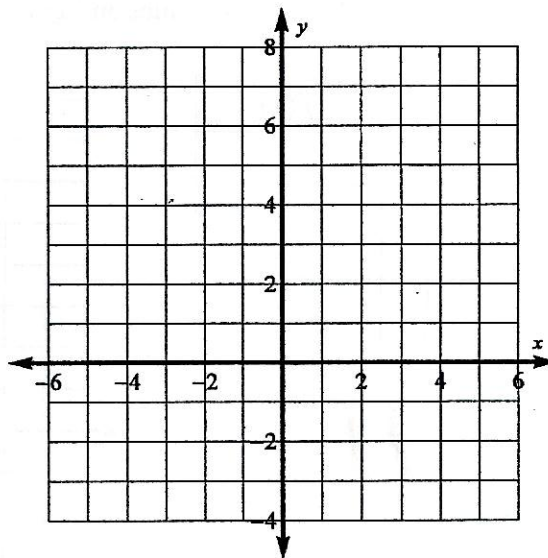


- b. Between which two consecutive integers does the graph cross the x -axis?
- c. Fill in the blanks with *negative*, *positive*, or *zero*. As the x -values increase, the graph crosses the x -axis in the interval where the value of y changes from _____ to _____.
- d. What is the y -intercept of the graph?
- e. Is $f(x)$ an increasing or a decreasing function? Explain your reasoning.
- f. What is $f(-4)$? What is $f(1.384)$?
- g. When $f(x) = 32$, what is the value of x ?

2. Complete the following questions for the function, $f(x) = x^2 - 3$.

a. Complete the table of values and graph the function on the grid provided.

x	$f(x)$
-3	
-2	
-1	
0	
1	
2	
3	



b. Between which two pairs of consecutive integers does the graph cross the x -axis?

c. What is the y -intercept of the graph?

d. What is the equation for the axis of symmetry of the graph of $f(x)$?

e. What are the maximum and minimum values of $f(x)$?

f. What is the domain of the function? What is the range of the function?

g. For what values of the domain is $f(x)$ increasing? For what values of the domain is $f(x)$ decreasing?

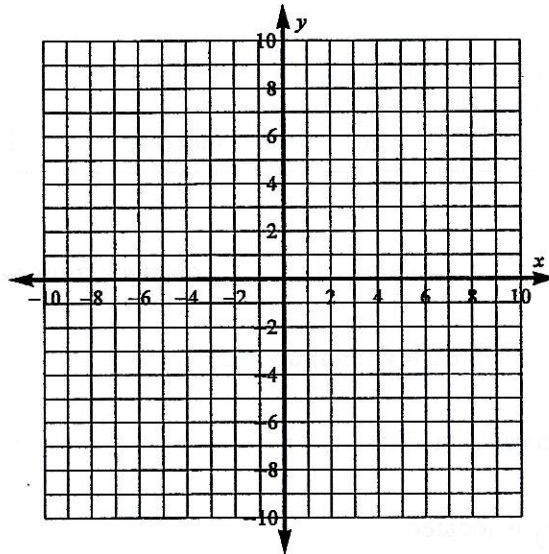
h. What is $f(5)$? What are the values of x when $f(x) = 94$?

i. Fill in the blanks with $-\infty$, ∞ , or 0 . As x approaches $-\infty$, y approaches _____.

j. Fill in the blanks with $-\infty$, ∞ , or 0 . As x approaches ∞ , y approaches _____.

3 Given a table of values for $g(x)$, graph the ordered pairs and complete the following questions.

x	$g(x)$
-3	-1
0	2
1	5
3	-4
5	-4



a. Sketch the graph using the ordered pairs and the listed conditions.

- i. The graph is linear and increasing on the interval $-3 \leq x \leq 0$
- ii. The graph is linear and increasing on the interval $0 \leq x \leq 1$
- iii. The graph is linear and decreasing on the interval $1 \leq x \leq 3$
- iv. The graph is constant on the interval $3 \leq x \leq 5$

b. What is the average rate of change for each of the intervals of x shown in the table?

c. The function, $g(x)$, is composed of 4 linear segments and is called a piecewise function. Complete each piece of the equation for $g(x)$.

$$g(x) = \begin{cases} \underline{\quad}x + \underline{\quad}, & -3 \leq x \leq 0 \\ \underline{\quad}(x-1) + 5, & 0 \leq x \leq 1 \\ \underline{\quad}(x-3) - 4, & 1 \leq x \leq 3 \\ -4, & \underline{\quad} \leq x \leq 5 \end{cases}$$

4.

Use the options in the cells of the table to complete the sentences that describe the graph of a function $y = f(x)$. Some choices may be used more than once, while others may not be used at all.

y	negative	positive	x	upwards	left
downwards	right	zero	increase	decrease	$f(x) = 0$

The graph crosses the x -axis when the value of _____ changes from negative to _____ or from positive to _____. For increasing intervals, the function values _____ as the x -values increase. For decreasing intervals, the function values decrease as the x -values _____. When $f(x) = 0$, the point $(x, f(x))$ is located on the _____-axis and is called the _____-intercept. When the value of x is _____, the point $(x, f(x))$ is located on the y -axis and is called the _____-intercept.