Name _____ Algebra 1 Module 4 Lesson 16-18

Problem Set

1. a. What is the y-intercept of the graph of $f(x) = x^2 - 2x - 15$?

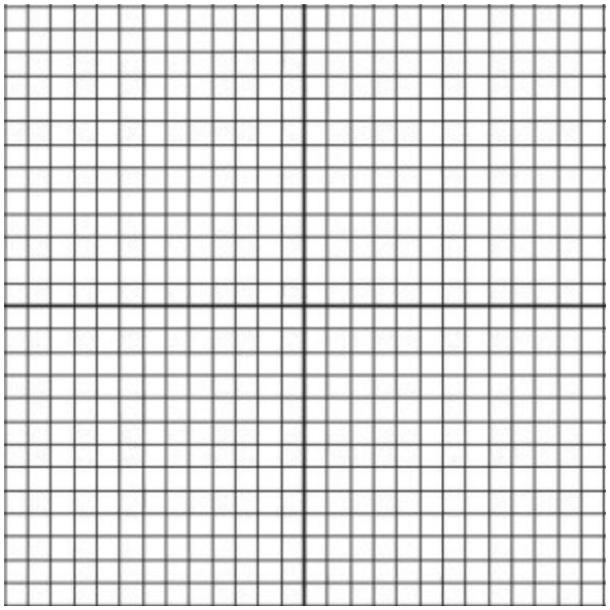
b. What are the x-intercepts (roots) of the graph of $f(x) = x^2 - 2x - 15$?

c. What is the equation of the axis of symmetry of the graph of $f(x) = x^2 - 2x - 15$?

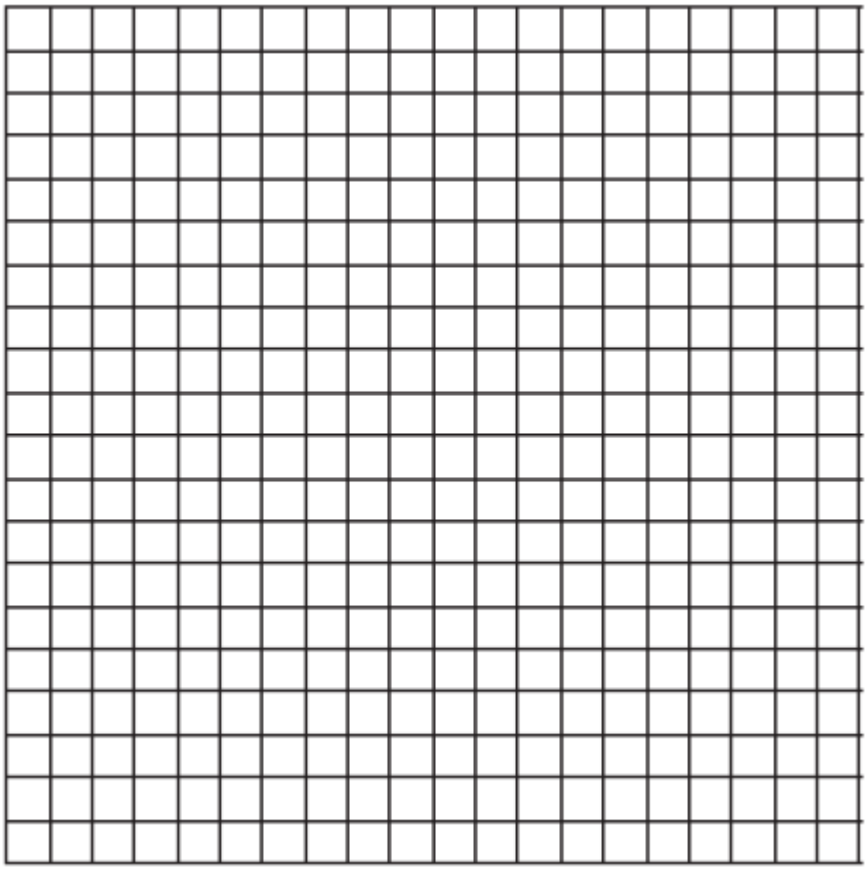
d. What is the minimum value of the graph of $f(x) = x^2 - 2x - 15$?

e. What is the vertex of the graph of $f(x) = x^2 - 2x - 15$?

f. Graph the equation $f(x) = x^2 - 2x - 15$.



2. Graph the following equation $f(x) = -x^2 + 2x + 15$ and identify the roots and the vertex.



3. a. What is the y-intercept of the graph of $f(x) = \frac{1}{2}x^2 + 5x + 6$?

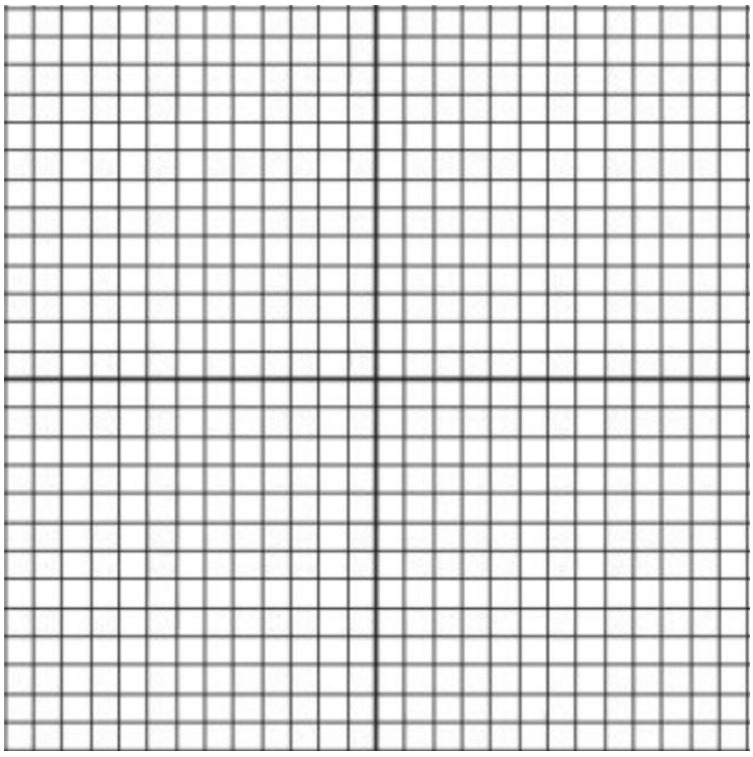
b. What are the x-intercepts (roots) of the graph of $f(x) = \frac{1}{2}x^2 + 5x + 6$?

c. What is the equation of the axis of symmetry of the graph of $f(x) = \frac{1}{2}x^2 + 5x + 6$?

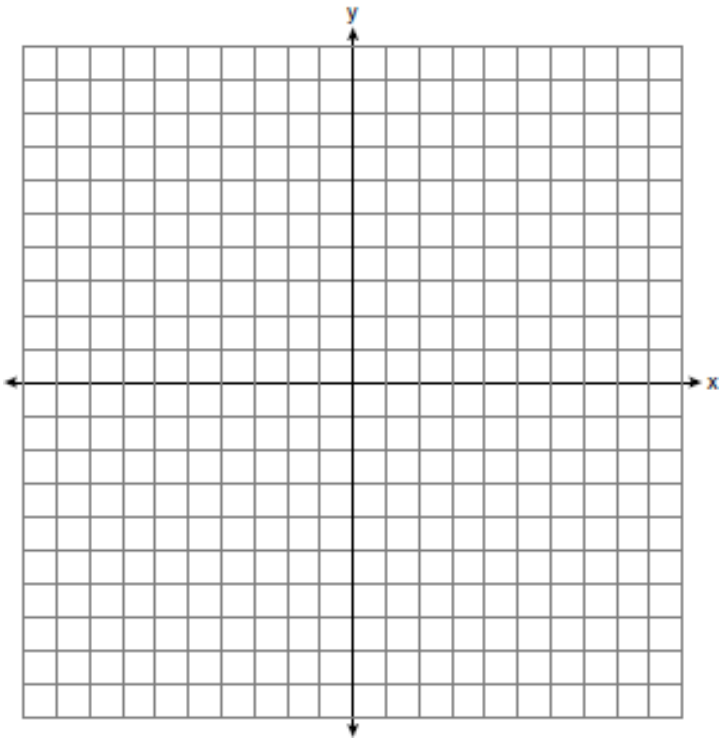
d. What is the minimum value of the graph of $f(x) = \frac{1}{2}x^2 + 5x + 6$?

e. What is the vertex of the graph of $f(x) = \frac{1}{2}x^2 + 5x + 6$?

f. Graph the equation $f(x) = \frac{1}{2}x^2 + 5x + 6$.



4. On the same set of axes graph and label $y = x^2$, $y = (x-2)^2$, and $y = (x+2)^2$ on the interval $-3 \leq x \leq 3$.



The graph of $y = (x-2)^2$ is a translation the graph of $y = x^2$ _____ units to the _____.

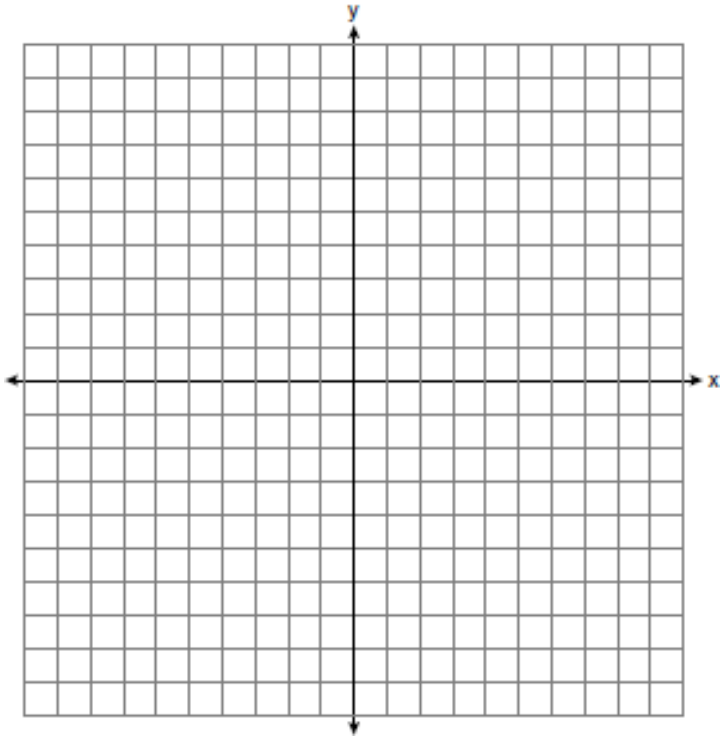
The graph of $y = (x+2)^2$ is a translation the graph of $y = x^2$ _____ units to the _____.

The vertex of the graph of $y = x^2$ is _____.

The vertex of the graph of $y = (x-2)^2$is _____.

The vertex of the graph of $y = (x+2)^2$is _____.

5. On the same set of axes graph and label $y = x^2$, $y = x^2 - 3$, and $y = x^2 + 3$.



The graph of $y = x^2 - 3$ is a translation the graph of $y = x^2$ _____ units _____.

The graph of $y = x^2 + 3$ is a translation the graph of $y = x^2$ _____ units _____.

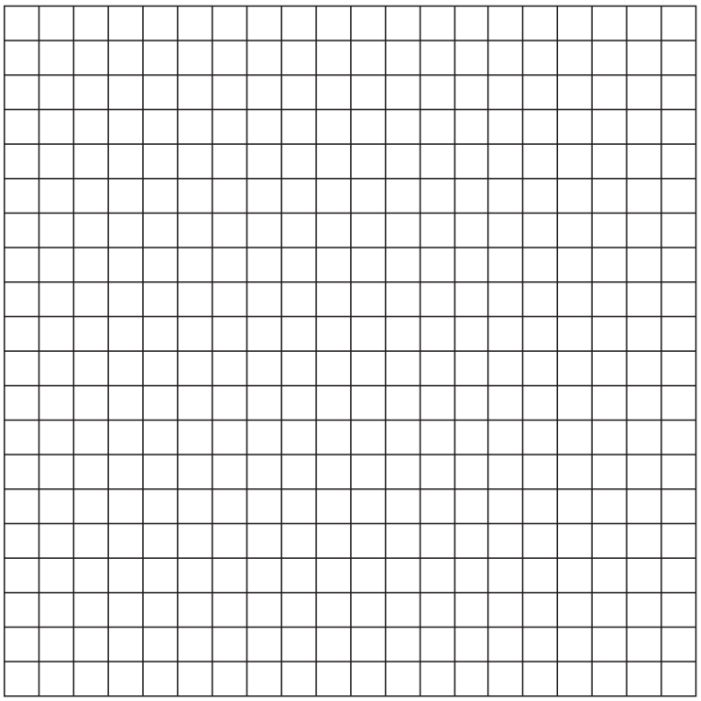
The vertex of the graph of $y = x^2$ is _____.

The vertex of the graph of $y = x^2 - 3$ is _____.

The vertex of the graph of $y = x^2 + 3$ is _____.

6. Use your graphing calculator to create a data table for the functions $y = x^2$ and $y = \sqrt{x}$ for a variety of x-values, round decimal answers to the nearest hundredth. Graph both equations below.

x	$y = x^2$	$y = \sqrt{x}$
-4		
-3		
-2		
-1		
0		
1		
2		
3		
4		



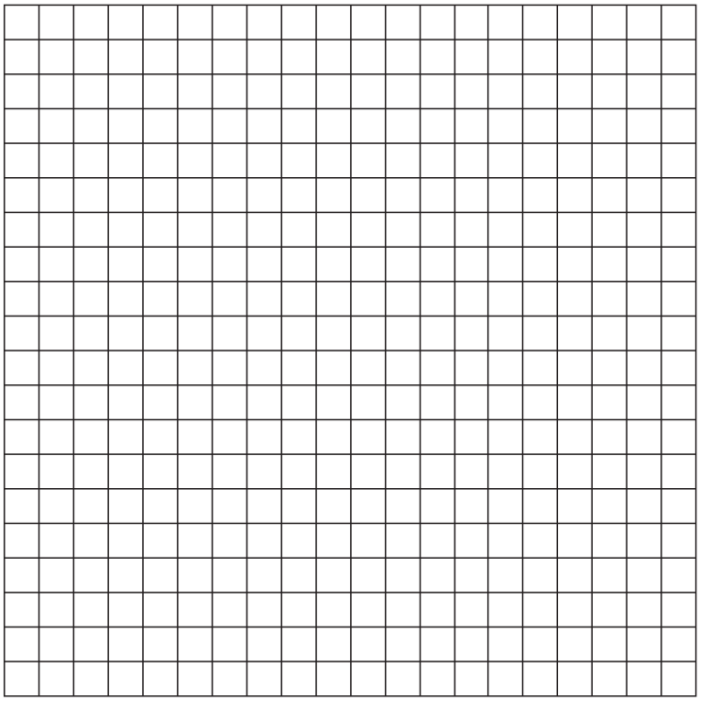
a. What is the domain of the function $y = \sqrt{x}$?

b. What is the range of the function $y = \sqrt{x}$?

c. How are the graphs of $y = \sqrt{x}$ and $y = x^2$ related?

7. Create data tables for $y = x^3$ and = $y = \sqrt[3]{x}$ and graph both functions on the same set of axes. Round decimal answers to the nearest hundredth. Graph both equations below.

x	$y = x^3$	$y = \sqrt[3]{x}$
-8		
-2		
-1		
0		
1		
2		
8		



a. What is the domain of the function $= \sqrt[3]{x}$?

b. What is the range of the function $= \sqrt[3]{x}$?

c. How are the graphs of $y = x^3$ and $y = \sqrt[3]{x}$ related?