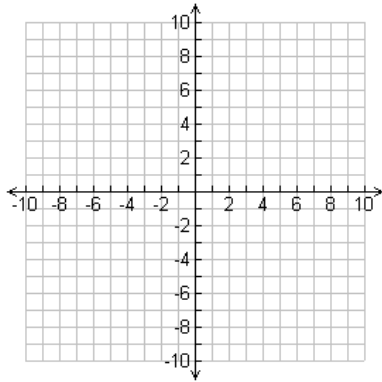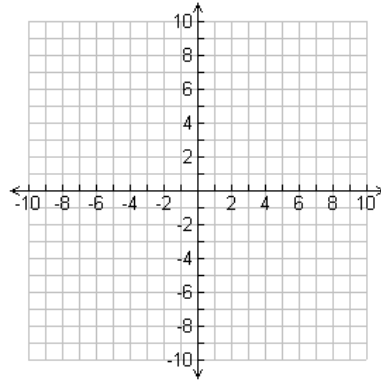## SM2 4.3: Vertex Form

Graph each function. Include the vertex and at least two other points.
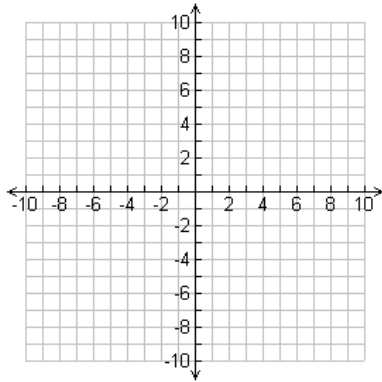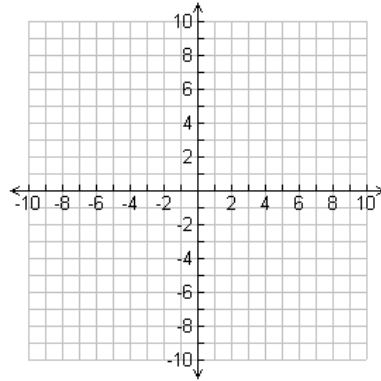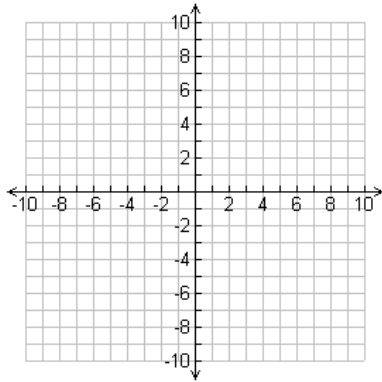
1) $y = (x + 4)^2 - 1$

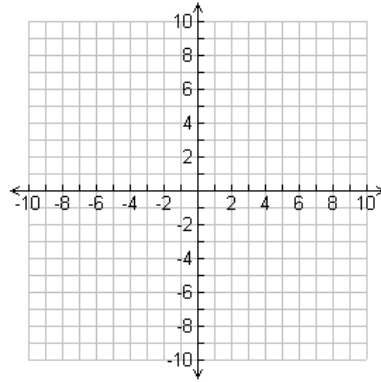2) $y = |x + 4| - 1$

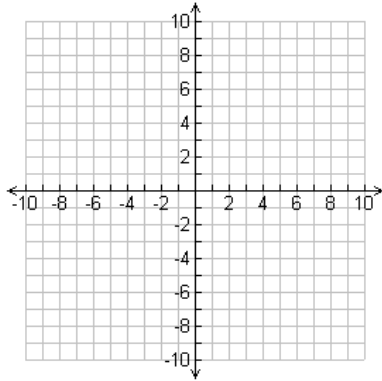3) $y = -3|x - 2| - 4$

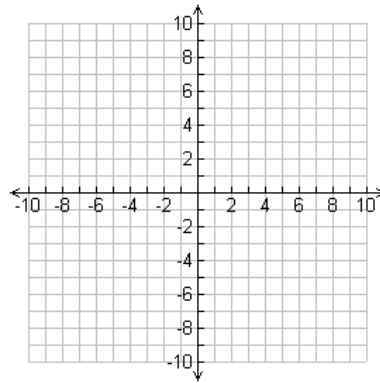4) $f(x) = \frac{1}{2}(x + 3)^2 + 4$

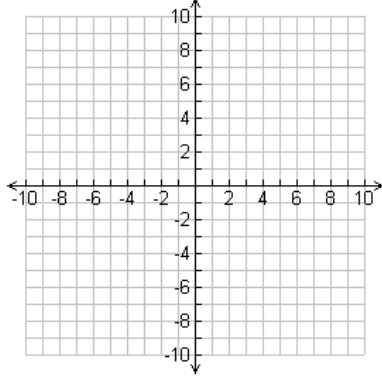5) $y = -2(x - 2)^2 - 2$

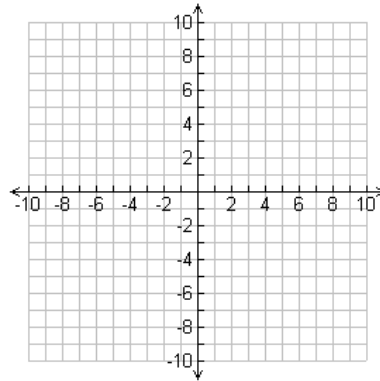6) $y = 4|x + 3| + 4$

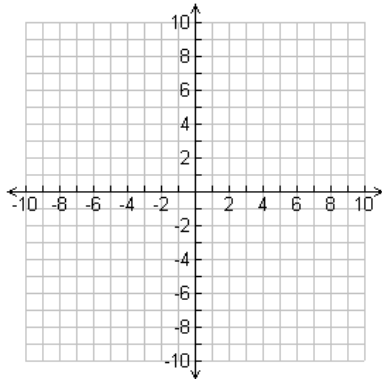7) $f(x) = \frac{1}{3}|x + 5| + 2$

8) $y = |x - 3| + 2$
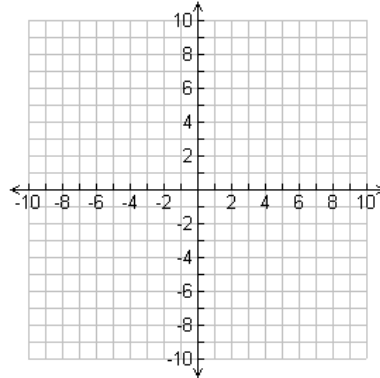
9) $f(x) = \frac{1}{3}(x - 3)^2 + 2$

10) $y = -(x + 3)^2 - 1$

11) $y = 2\left(x - \frac{1}{2}\right)^2 + \frac{3}{2}$

12) $h(x) = \left|x + \frac{1}{2}\right| + \frac{1}{4}$

For each function, identify the indicated properties. You may graph the function if it helps you see the properties.

13) $f(x) = 2(x - 1)^2 + 2$

Vertex:
Max:
Min:
Axis of Symmetry:

14) $y = -|x + 1| + 2$
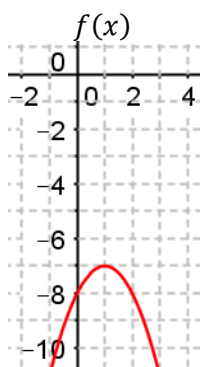
Vertex:
Axis of Symmetry:
Domain:
Range:

15) $y = |x + 4| + 3$

x-intercepts:
Positive:
Negative:

16) $f(x) = -\frac{1}{2}(x - 2)^2 + 3$

y-intercept:
Increasing:
Decreasing:

17) Which function has the larger maximum?

$f(x)$

$g(x) = -\frac{1}{2}|x + 2|^2 - 8$

x	$h(x)$
-2	-11
-1	-9
0	-11
1	-17

Find the average rate of change of the function over the specified interval.

18) $f(x) = -2|x - 2| - 1, [-3, 0]$