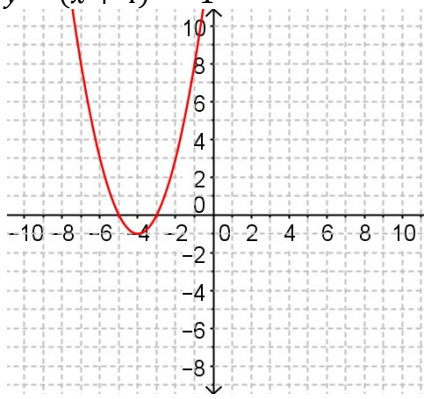
Name: _____

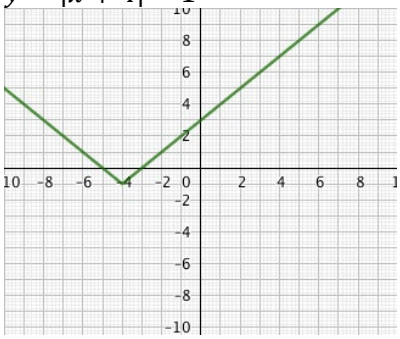
SM2 4.3: Vertex Form

Graph each function. Include the vertex and at least two other points.

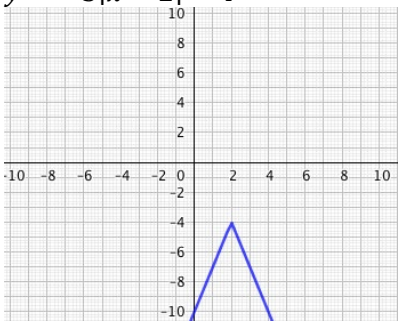
1) $y = (x + 4)^2 - 1$



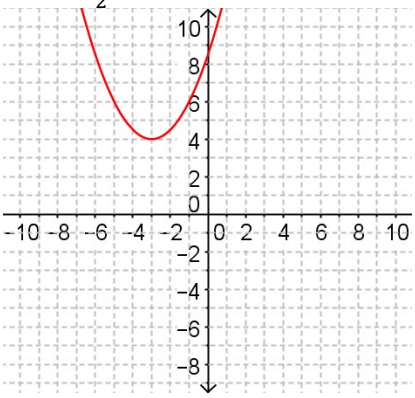
2) $y = |x + 4| - 1$



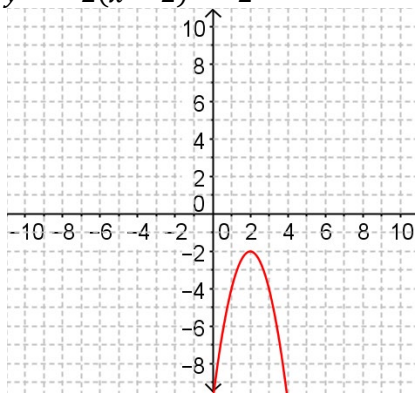
3) $y = -3|x - 2| - 4$



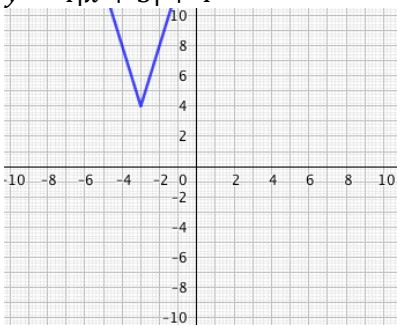
4) $f(x) = \frac{1}{2}(x + 3)^2 + 4$



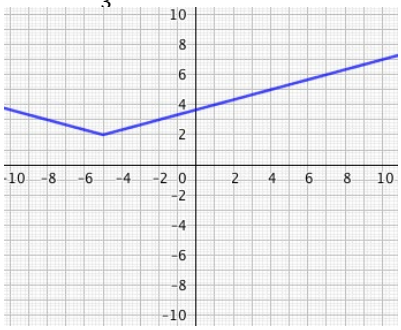
5) $y = -2(x - 2)^2 - 2$



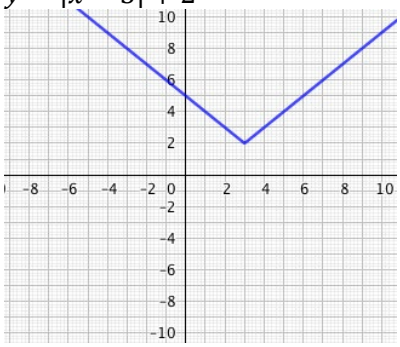
6) $y = 4|x + 3| + 4$



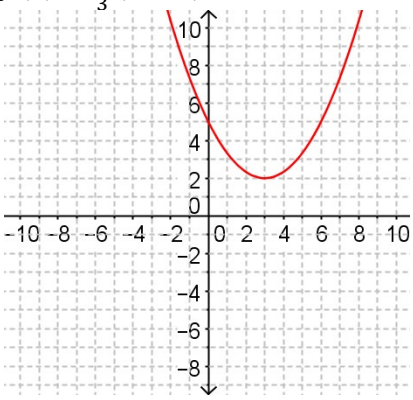
7) $f(x) = \frac{1}{3}|x + 5| + 2$



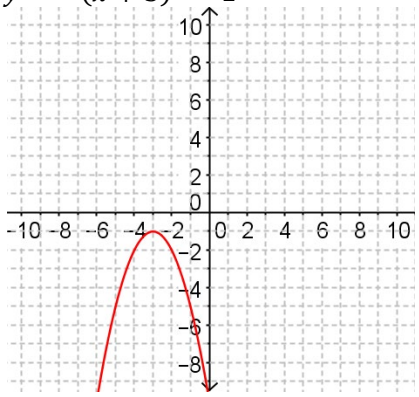
8) $y = |x - 3| + 2$



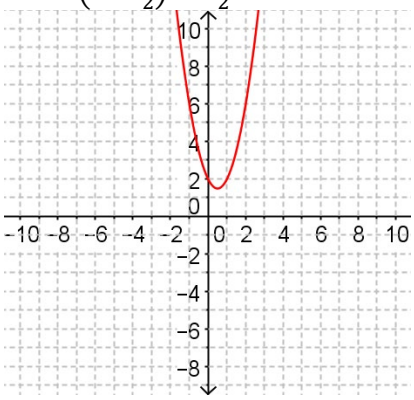
9) $f(x) = \frac{1}{3}(x - 3)^2 + 2$



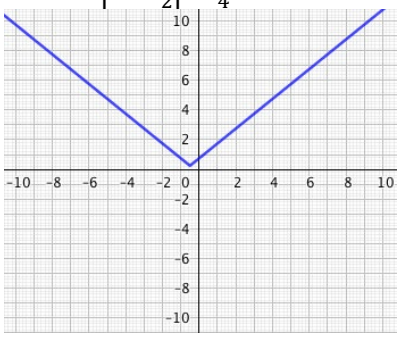
10) $y = -(x + 3)^2 - 1$



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: $(1, 2)$
Max: none
Min: $(1, 2)$
Axis of Symmetry: $x = 1$

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

Vertex: $(-1,2)$
Axis of Symmetry: $x = -1$
Domain: $(-\infty, \infty)$
Range: $(-\infty, 2]$

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

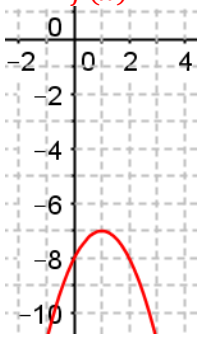
x-intercepts: $\emptyset$
Positive: $(-\infty, \infty)$
Negative: $\emptyset$

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

y-intercept: $(0, 1)$
Increasing: $(-\infty, 2)$
Decreasing: $(2, \infty)$

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

$f(x)$ has the largest maximum.

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

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

$f(-3) = -11$
$f(0) = -5$

$$\frac{-5-(-11)}{0-(-3)}$$
$$\frac{6}{3} = \mathbf{2}$$