Name: _____

SM2 6.4: Finding Vertex Form

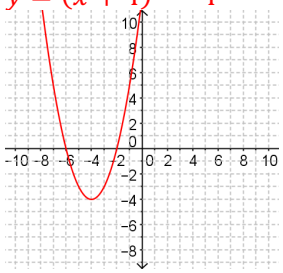
Put each equation into vertex form.

1) $y = (x+2)^2 - 3$
2) $f(x) = -(x+1)^2 + 4$
3) $y = (x-1)^2 - 3$
4) $y = 2(x-1)^2 - 1$
5) $f(x) = -2(x-2)^2 - 3$
6) $g(x) = -4(x-1)^2 + 3$
7) $y = -\frac{1}{2}(x+4)^2 - 1$
8) $y = \left(x + \frac{3}{2}\right)^2 - \frac{13}{4}$

Put each equation into vertex form, then sketch the graph. Include the vertex point and the two anchor points (the two points that are on either side of the vertex).

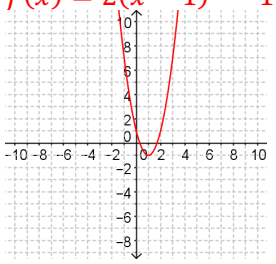
9) $y = x^2 + 8x + 12$

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



10) $f(x) = 2x^2 - 4x + 1$

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



Put each equation into vertex form, then identify the domain, range, vertex, axis of symmetry, and intervals of increasing and decreasing. You may graph the function if it helps you see the properties.

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

$y = (x-2)^2 - 3$

Domain: $(-\infty, \infty)$
Range: $[-3, \infty)$
Vertex: $(2, -3)$
Axis of Symmetry: $x = 2$
Increasing: $(2, \infty)$
Decreasing: $(-\infty, 2)$

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

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

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

13) $y = x^2 - 2x$

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

Domain: $(-\infty, \infty)$
Range: $[-1, \infty)$
Vertex: $(1, -1)$
Axis of Symmetry: $x = 1$
Increasing: $(1, \infty)$
Decreasing: $(-\infty, 1)$

14) $y = -2x^2 + 16x - 28$

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

Domain: $(-\infty, \infty)$
Range: $(-\infty, 4]$
Vertex: $(4, 4)$
Axis of Symmetry: $x = 4$
Increasing: $(-\infty, 4)$
Decreasing: $(4, \infty)$