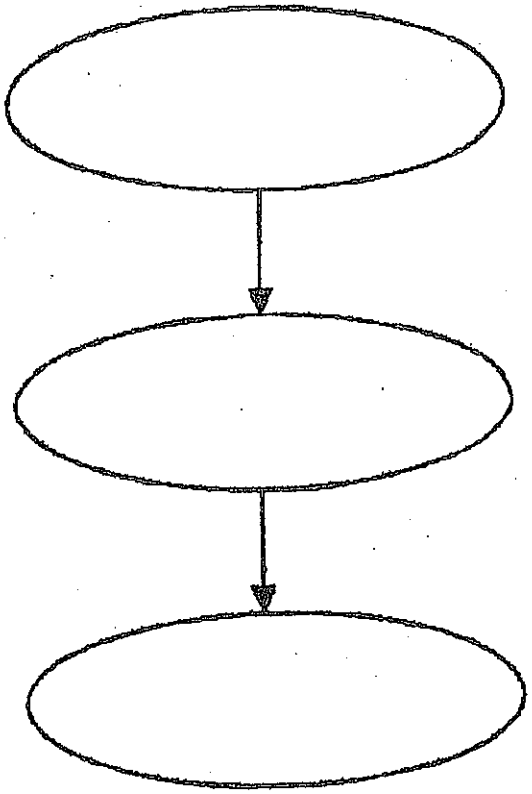
II. Vertex Form

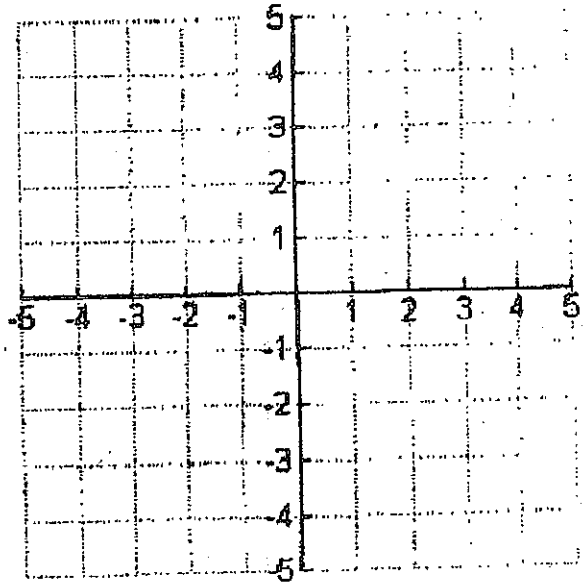
$f(x) = a(x - h)^2 + k$

(h, k) is the _____.

a determines the _____ and _____.



Graph $f(x) = 2(x - 1)^2 - 3$

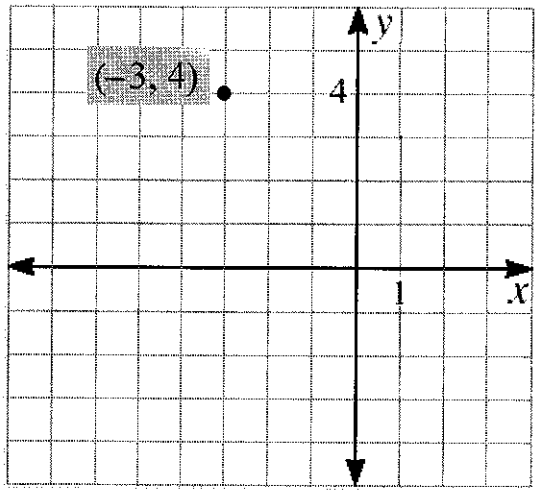


EXAMPLE **Graphing a Quadratic Function** in Vertex form

Graph $y = -\frac{1}{2}(x+3)^2 + 4$

SOLUTION

The function is in vertex form $y = a(x-h)^2 + k$.



$a = -\frac{1}{2}$, $h = -3$, and $k = 4$

$a < 0$, the parabola opens down.

To graph the function, first plot the vertex $(h, k) = (-3, 4)$.

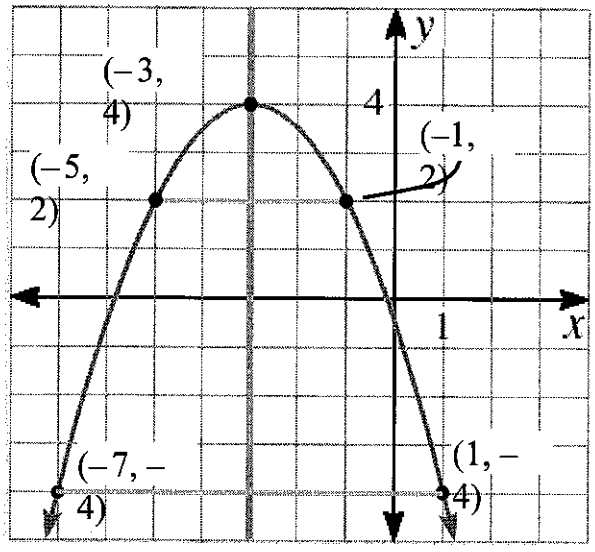
EXAMPLE **Graphing a Quadratic Function in Vertex Form**

Graph $y = -\frac{1}{2}(x+3)^2 + 4$

Draw the axis of symmetry $x = -3$.

Plot two points on one side of it, such as (–1, 2) and (1, –4).

Use symmetry to complete the graph.



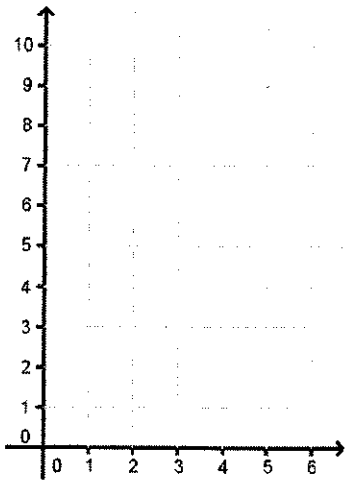
Name: Date: Period:

Practice Worksheet: Graphing Quadratic Functions in Vertex Form $y = a(x-h)^2 + k$

For #1-6, label the axis of symmetry, vertex, y-intercept, and at least three more points on the graph.

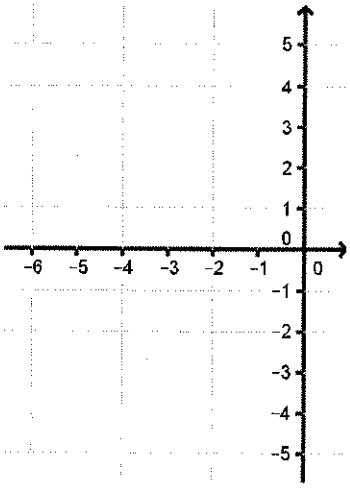
1] $y = (x-3)^2$
Axis of Symmetry is x=_____
Vertex: (____, ____)
Opens up or down?

y-intercept: (0,_____)



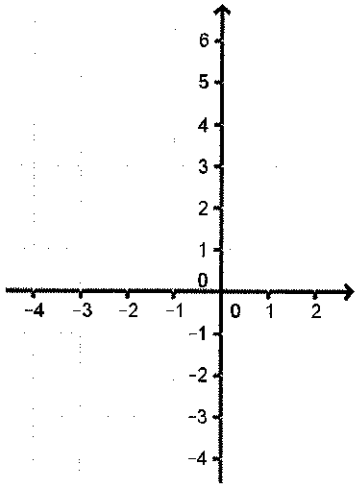
2] $y = -(x+3)^2 + 5$
Axis of Symmetry is x=_____
Vertex: (____, ____)
Opens up or down?

y-intercept. (0,_____)



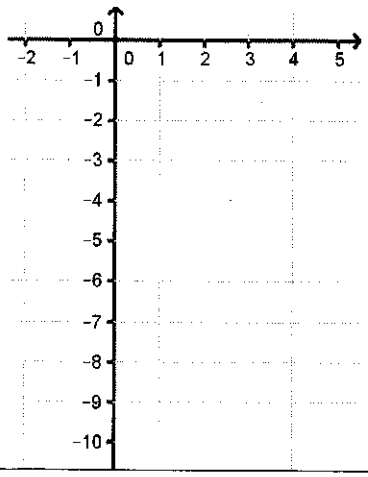
3] $y = 2(x+1)^2 - 3$
Axis of Symmetry is x=_____
Vertex: (____, ____)
Opens up or down?

y-intercept: (0,_____)



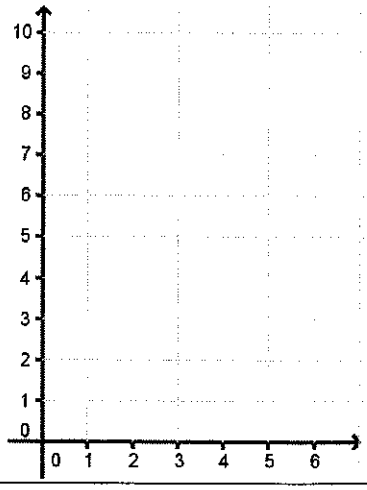
4] $y = -2(x-2)^2 - 1$
Axis of Symmetry is x=_____
Vertex: (____, ____)
Opens up or down?

y-intercept: (0,_____)



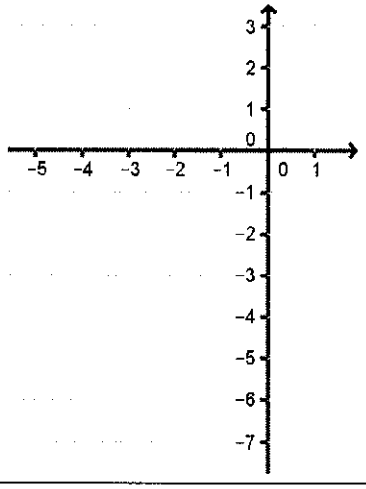
5] $y = \frac{1}{2}(x-3)^2 + 2$
Axis of Symmetry is x=_____
Vertex: (____, ____)
Opens up or down?

y-intercept: (0,_____)



6] $y = -\frac{1}{4}(x+2)^2 + 1$
Axis of Symmetry is x=_____
Vertex: (____, ____)
Opens up or down?

y-intercept: (0,_____)



Algebra 1

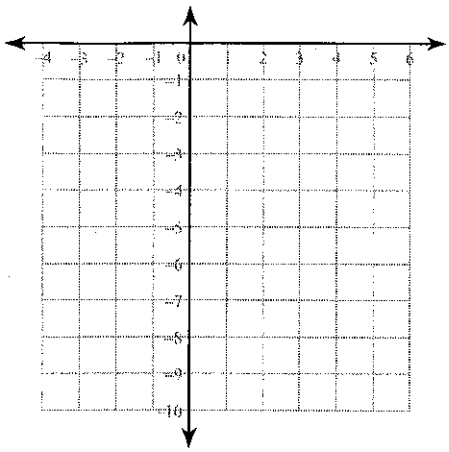
Name_____

Graphing Quadratics - Vertex Form

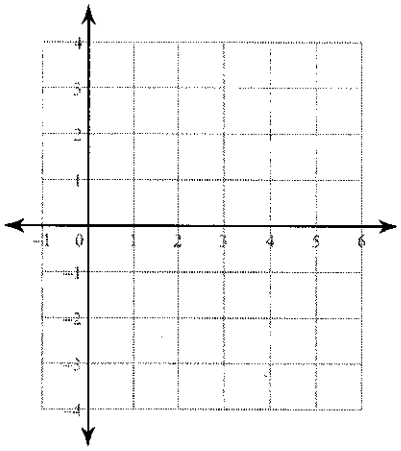
Date_____ Period____

Sketch the graph of each function.

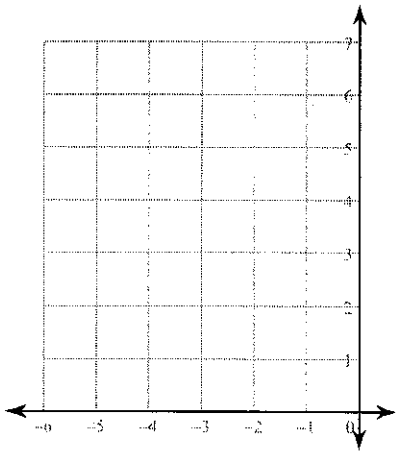
1) $y = -2(x-1)^2 - 1$



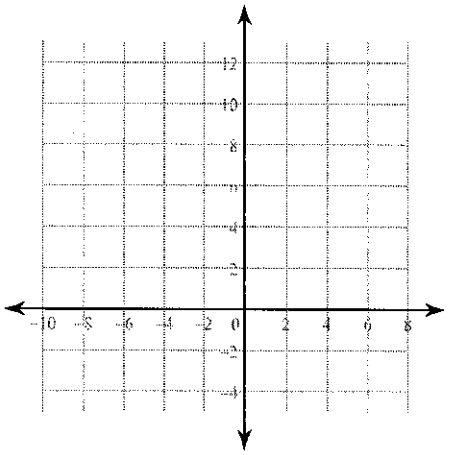
2) $y = -(x-4)^2 + 2$



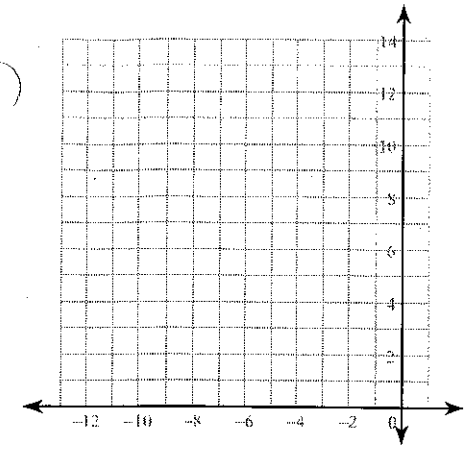
3) $y = (x+2)^2 + 2$



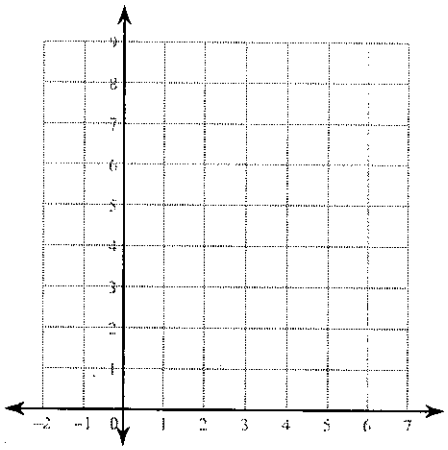
4) $y = 4(x+1)^2 - 4$



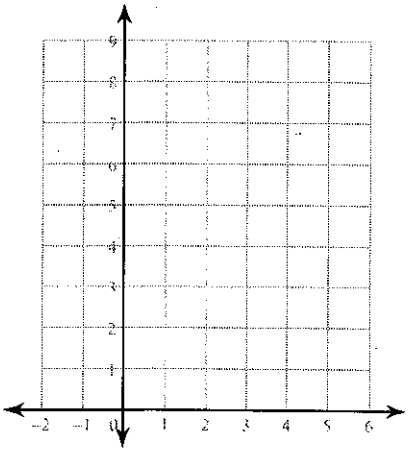
5) $f(x) = 3(x+2)^2 + 1$



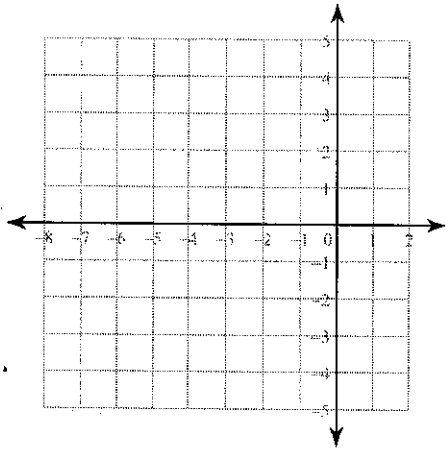
6) $f(x) = (x-4)^2 + 4$



7) $f(x) = (x-2)^2 + 4$

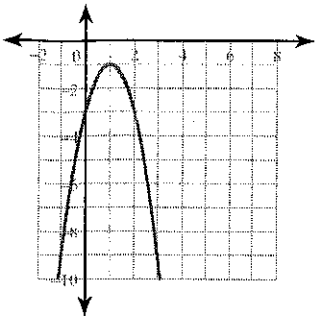


8) $f(x) = 2(x+3)^2 - 4$

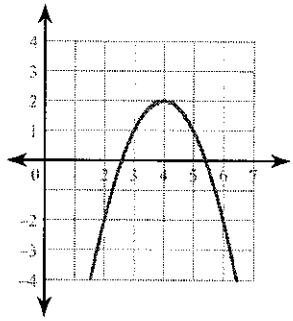


Answers to Graphing Quadratics - Vertex Form

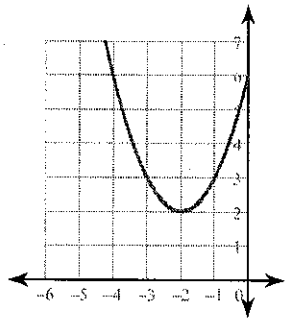
1)



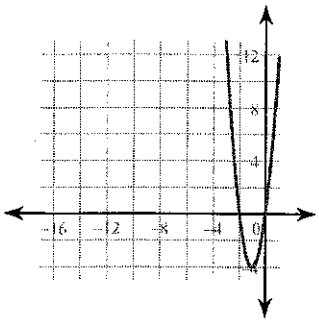
2)



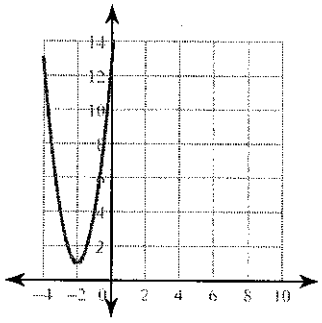
3)



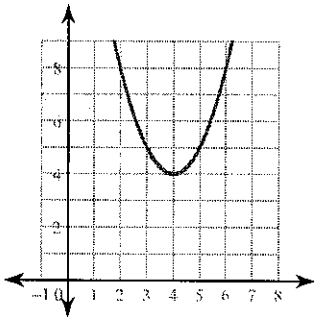
4)



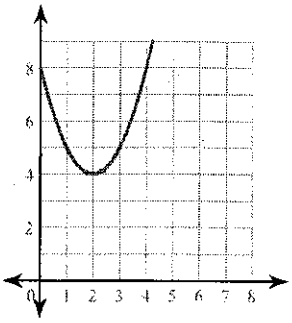
5)



6)



7)



8)