Name_____ Date_____ Period_____

Graphing Quadratic Functions

Algorithm:

In Vertex Form: $f(x) = a(x-h)^2 + k$

1) Find the vertex (h, k).
2) Pick two convenient x-values, find y.
3) Use symmetry to find two more points.

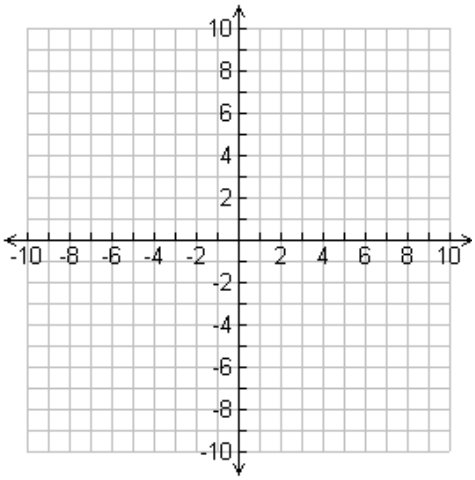
In Standard Form: $f(x) = ax^2 + bx + c$

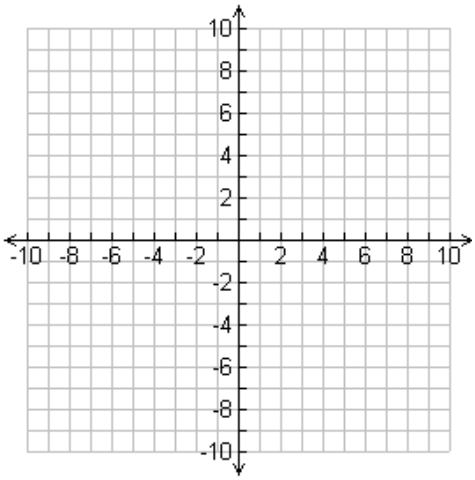
1) Find the vertex, $\left(-b/2a, \text{sub}\right)$
2) Pick two convenient x-values and find y.
3) Use symmetry to find two more points.

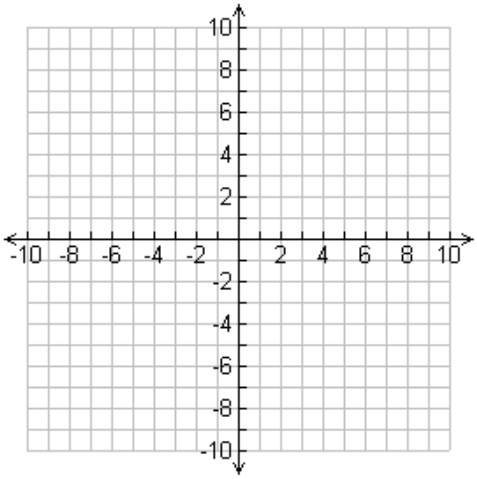
1) $f(x) = -5x^2 + 10x + 1$

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

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



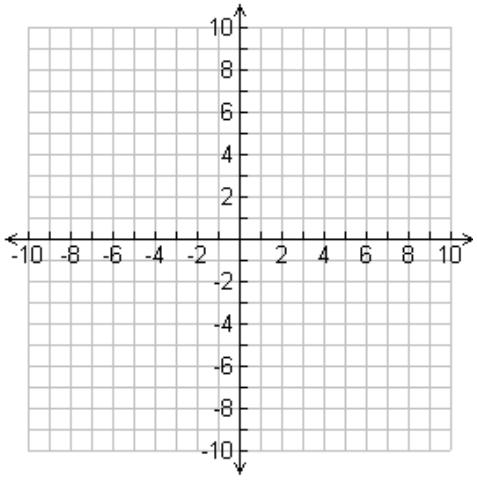


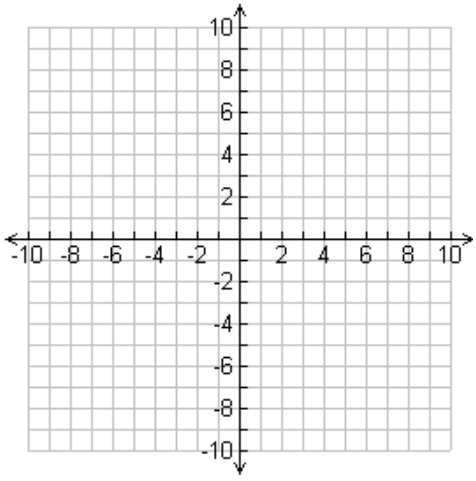


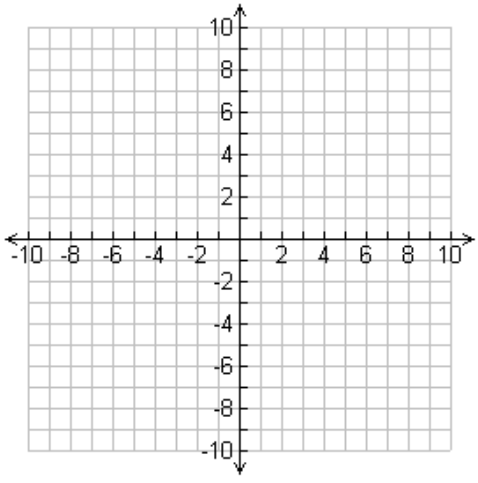
4) $f(x) = 3x^2 - 6x - 9$

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

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







7. Tell whether $y = -3(x+1)^2 + 4$ has a minimum value or a maximum value. Then, find that value.

8. Find the domain and the range of the function in the problem above.

9. For the function $y = -x^2 - 6x - 7$ find the vertex and the axis of symmetry.

10. For the function $y = 3x^2 - 30x + 77$ find the vertex and the axis of symmetry.

11. Explain the effect of *a*, *h*, and *k* on the following function: $f(x) = a(x-h)^2 + k$

12. If the quadratic function has a minimum value and does not have a maximum value, what does that tell you?

Technology: Use your graphing calculator.

13. **Minimize Cost**. A baker has modeled the monthly operating costs for making wedding cakes by the function $y = 0.5x^2 - 12x + 150$ where *y* is the total cost in dollars and *x* is the number of cakes prepared.

a) Find the vertex and axis of symmetry.

b) What is the minimum cost?

c) How many cakes should be prepared each month to yield the minimum cost.

14. **Operating Costs**. For a period of 48 months, the average monthly operating cost for a small business, *C* (in dollars), can be approximated by the model $C = 0.55t^2 + 550$, where *t* is the number of months. During which month was the average operating cost $1430?