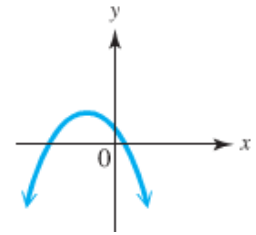
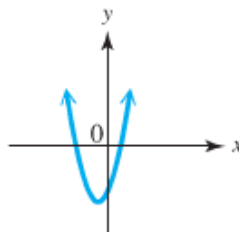
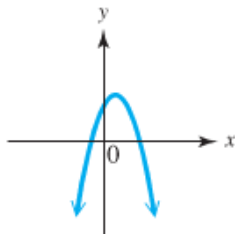


1. **Fill in the blank**

- a) When a is positive, the parabola given by the function $f(x) = ax^2 + bx + c$ opens _____.
- b) When a is negative, the parabola given by the function $f(x) = ax^2 + bx + c$ has a _____ point.
- c) For a parabola given by the function $f(x) = ax^2 + bx + c$, the _____ of the vertex is $-\frac{b}{2a}$.
- d) For a parabola given by the function $f(x) = ax^2 + bx + c$, the equation of the _____ is $x = -\frac{b}{2a}$.
- e) If the discriminant of the quadratic trinomial given by the function $f(x) = ax^2 + bx + c$ is positive, the parabola has _____ x -intercept(s).

2. **Concept Check** Match each equation with its graph.

- a) $f(x) = 2x^2 + 4x - 3$
- b) $f(x) = -x^2 + 3x + 5$
- c) $f(x) = -\frac{1}{2}x^2 - x + 1$



3. Using completing the square method, find the **vertex** of each parabola. Decide whether the graph opens up or down, and whether it is wider, narrower, or the same shape as the graph of $y = x^2$.

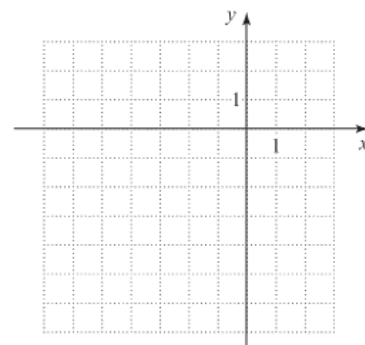
- a) $f(x) = x^2 + 8x + 14$
- b) $f(x) = -3x^2 + 12x - 8$
- c) $f(x) = \frac{1}{2}x^2 + 10x - 5$
- d) $f(x) = 2x^2 - 6x + 7$

4. Calculate the discriminant and use the formula for the vertex to complete the table.

function	opening (up, down)	vertex	maximum or minimum point	range	number of x-intercepts
$f(x) = -x^2 - 5x + 5$					
$f(x) = 3x^2 + 8x + 7$					
$f(x) = x^2 - 6x + 9$					
$f(x) = x^2 - 2$					
$f(x) = 6x - 5 - 3x^2$					

5. For each parabola, give the vertex, shape, opening, and then graph it. State the equation of the axis of symmetry, domain, and range.

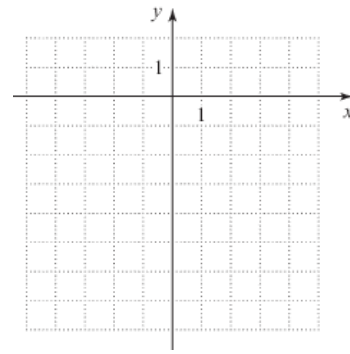
- a) $f(x) = x^2 + 5x + 1$



Domain:
Range:

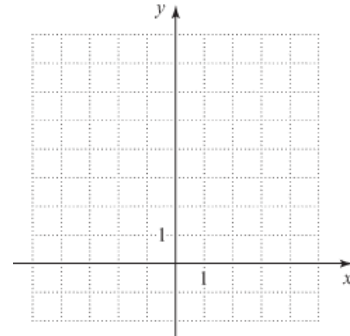
9.6 In-class Practice

b) $g(x) = -2x^2 + 2x - 3$



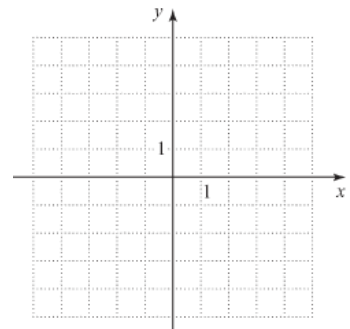
Domain:
Range:

c) $h(x) = 3x^2 - 3x + 1$



Domain:
Range:

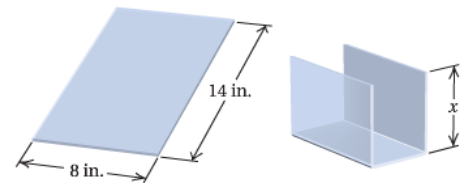
d) $f(x) = -\frac{1}{2}x^2 + 3$



Domain:
Range:

6. What is the minimum product of two numbers that differ by 9? What are the numbers?

7. Econ Plastics plans to produce a one-compartment vertical file by bending the long side of an 8-in. by 14-in. sheet of plastic along two lines to form a U shape. How tall should the file be in order to maximize the volume that the file can hold?



8. A company uses the function $C(x) = 0.02x^2 - 3.4x + 150$ to model the unit cost in dollars for producing x stabilizer bars. For what number of bars is the unit cost at its minimum? What is the unit cost at that level of production?

9. A Florida citrus grower estimates that if 60 orange trees are planted, the average yield per tree will be 400 oranges. The average yield will decrease by 4 oranges for each additional tree planted on the same acreage. How many trees should the grower plant to maximize the total yield?