## 8.5 I can determine the domain and range of quadratic functions.

**State the domain and range for each quadratic**

1) $2x^2 - 12x - 10 = 0$

2) $5n^2 + 9n - 12 = 0$

3) $7v^2 - 11v - 7 = 0$

4) $6b^2 - 9b - 15 = 0$

5) $r^2 - 9 = 0$

6) $3m^2 + 10m - 11 = 0$

7) $2n^2 - 6 = 0$

8) $x^2 - 6 = 0$

## 8.6 I can solve quadratic systems graphically with and without technology.

**Solve the quadratic equation.**

1) $3k^2 - 7k - 48 = 0$

2) $6a^2 + a - 12 = 0$

3) $2x^2 + 7x - 85 = 0$

4) $6x^2 + 5x - 14 = 0$

**Find the zeros of the function**

5) $10x^2 + 5x - 4 = 0$

6) $2m^2 + m - 8 = 0$

7) $5n^2 - 80 = 0$

8) $6p^2 - 9p - 1 = 0$

**Find the x intercepts of the quadratic function**

9) $4r^2 - 100 = 0$

10) $b^2 - 2 = 0$

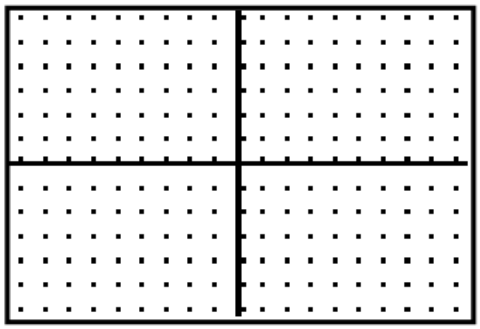
11) $10n^2 - 5n - 8 = 0$

12) $4x^2 + x - 60 = 0$

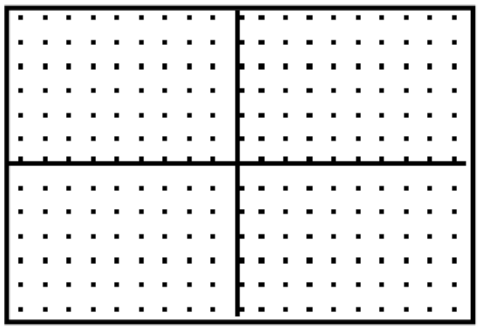
**8.9 I can explain the transformations of quadratic functions.**

**Identify the transformations to the parent function $y = x^2$ in the following equations. Graph each function**

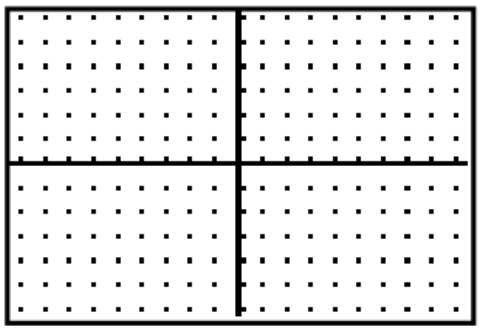
$y = (x+2)^2 - 3$



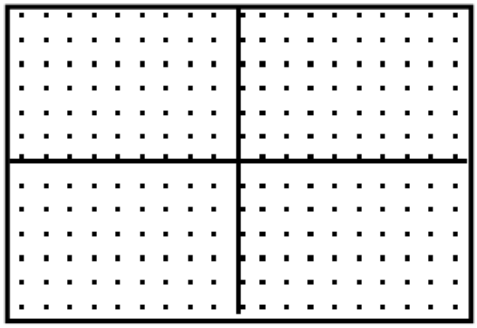
$y = -(x-1)^2 + 4$



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



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



**Describe the graph of each function in terms of transformations on the graph of y=x^2**

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

**b)** $f(x) = -x^2 + 5$

**c)** $g(x) = 4(x + 2)^2 - 8$

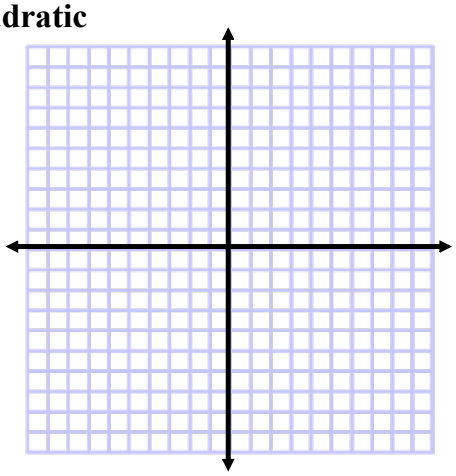
**d)** $h(x) = -3(x - 1)^2 - 1$

**8.8 I can use transformations to draw the graph of quadratic functions.**

The graph of $f(x) = x^2$ has been stretched vertically by a factor of 10 and translated 5 units to the right and 8 units down.

**a)** Write the equation of the graph resulting from the transformations.

**b)** Sketch the graph of $f(x) = x^2$ and its image after the transformations.



**Example 4: Use the description to write a transformed quadratic function in vertex form.**

a) The parent function $f(x) = x^2$ is vertically stretched by a factor of 4/3 and then translated 2 units right and 5 units down

b) The parent function $f(x) = x^2$ is reflected across the $x$-axis and translated 5 units left and 1 unit up to create $g$.

**8.10 I can determine a quadratic function that fits a graph.**

**Find a quadratic model for the set of values.**

1. (–2, –20), (0, –4), (4, –20)

2.

| $x$ | –2 | 0 | 4 |
|---|---|---|---|
| $f(x)$ | 1 | –3 | 85 |

3. Find a quadratic function to model the values in the table. Predict the value of $y$ for $x = 6$.

| $x$ | $y$ |
|---|---|
| –1 | 2 |
| 0 | –2 |
| 3 | 10 |

**Find a quadratic model for the set of values.**

1. (–2, 2), (0, 4), (4, –40)

2.

| $x$ | –2 | 0 | 4 |
|---|---|---|---|
| $f(x)$ | –24 | –4 | –36 |

3. Find a quadratic function to model the values in the table. Predict the value of $y$ for $x = 7$.

| $x$ | $y$ |
|---|---|
| –1 | 2 |
| 0 | 2 |
| 3 | –34 |

## 8.11 I can graph and analyze real-world problems involving quadratics.

A manufacturer determines that the number of drills it can sell is given by the formula $D = -3p^2 + 180p - 285$, where $p$ is the price of the drills in dollars.

**a.** At what price will the manufacturer sell the maximum number of drills?

**b.** What is the maximum number of drills that can be sold?

Dalco Manufacturing estimates that its weekly profit, $P$, in hundreds of dollars, can be approximated by the formula $P = -3x^2 + 6x + 10$, where $x$ is the number of units produced per week, in thousands.

**a.** How many units should the company produce per week to earn the maximum profit?

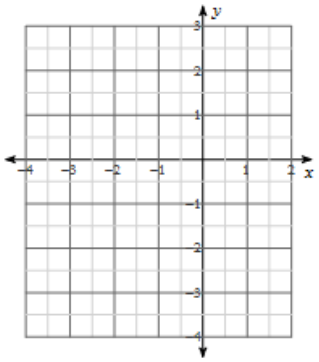
**b.** Find the maximum weekly profit.

The function $y = -16t^2 + 486$ models the height $y$ in feet of a stone $t$ seconds after it is dropped from the edge of a vertical cliff. How long will it take the stone to hit the ground? Round to the nearest hundredth of a second.

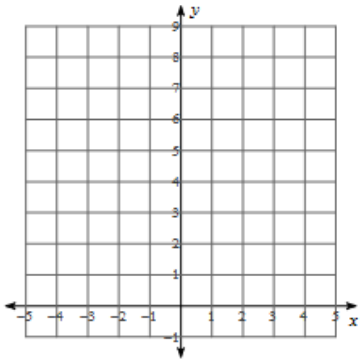
**8.12 I can graph quadratic inequalities with and without technology**

**Sketch the graph of each function.**

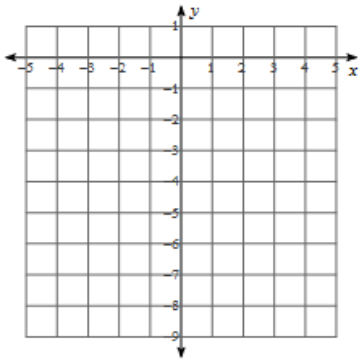
1) $y \le -\frac{1}{3}x^2$



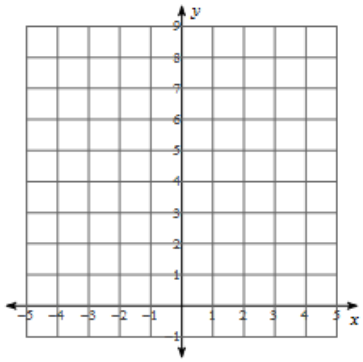
2) $y \le 2x^2$



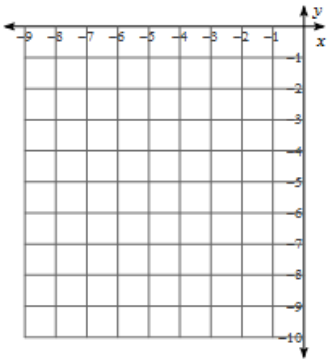
3) $y \ge -2x^2$



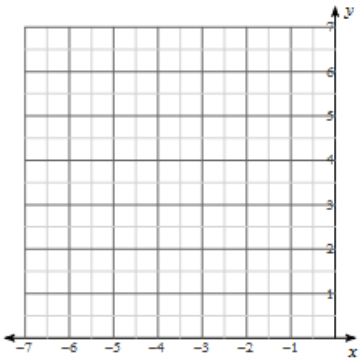
4) $y < 2x^2$



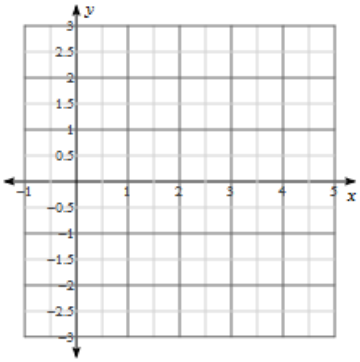
5) $y > -2x^2 - 16x - 33$



6) $y > x^2 + 8x + 18$



7) $y < \frac{1}{2}(x-2)^2 - 1$



8) $y \le 2(x-4)^2 - 3$