



- 5) Part of a playground jungle gym has a metal arch. The arch has various footholds to make it climbable. One of these footholds is 2 feet off the ground and 2 feet from the end of the arch. If the ends of the arch are 7 feet apart, what is the equation that can model the arch?
- 6) As your friend does a backbend, you notice that it makes the shape of a parabola. When bent over, your friend's hands are 2 feet away from her feet. The highest spot of the backbend is halfway between her feet at 2.5 feet. Find the equation to model the backbend.

**Sketch the graph of each function, labeling the dimensions of your window. Then identify each key feature.**

$$7) y = -\frac{1}{2}x^2 + \frac{5}{2}x - \frac{9}{8}$$

- 8) Is the vertex a max or a min?

Vertex:

y-intercept:

x-intercept(s):

Coordinate point at  $x = 6$ :

$$9) y = -3x^2 - 9x - 5$$

- 10) Is the vertex a max or a min?

Vertex:

y-intercept:

x-intercept(s):

Coordinate point at  $x = 7$ :

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

12) Is the vertex a max or a min?

Vertex:

y-intercept:

x-intercept(s):

Coordinate point at  $x = -10$ :

13) A ball is thrown into the air. The path of the ball is represented by the equation  $h = -(t - 4)^2 + 16$  where  $h$  represents height in feet and  $t$  represents time.

i) What is the ball's maximum height?

ii) How long does it take for the ball to hit that maximum height?

iii) How high will the ball be after 5 seconds? 2 seconds?

iv) At what time will the ball bounce on the ground?

v) Give the domain and range of this situation.

14) After  $t$  seconds, a ball is tossed in the air from ground level and reaches a height of  $h$  (in feet) given by the equation:  $h = -16(t - 4.5)^2 + 324$

i) What is the height after 3 seconds?

ii) What is the maximum height the ball will reach?

iii) After how many seconds will the ball hit the ground?

iv) Give the domain and range for this situation.