Secondary Math 2 Name_____

6.3 Quadratic Applications

Date_____ Period____

Answer ALL of the following questions. If the graph is not provided, SKETCH A GRAPH OF EACH SITUATION.

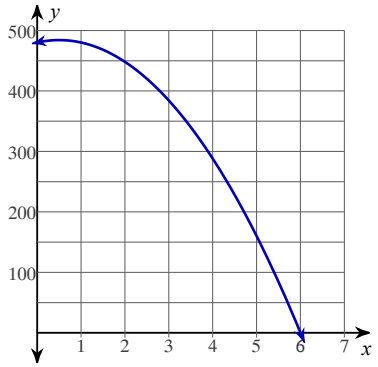
1) Jason jumped off of a cliff into the ocean in Acapulco while vacationing with some friends. His height as a function of time could be modeled by the function below. where x is the time in seconds and h is the height in feet.

   a. Estimate how long it took Jason to reach his maximum height?

   b. What was the highest point that Jason reached?

   c. Jason hit the water after how many seconds?

   d. About what was Jason's height after 2.5 seconds?



2) If a toy rocket is launched vertically upward from ground level with an initial velocity of 128 feet per seconds, then its height, y, after x seconds is displayed by the parabola below. (assume if air resistance is neglected).

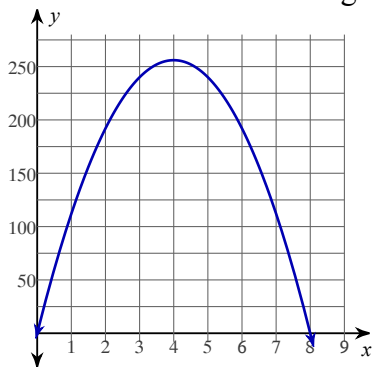
   a. How long will it take for the rocket to return to the ground?

   b. After how many seconds will the rocket be 112 feet above the ground (be careful, there are two answers on this one)?

   c. How long will it take the rocket to hit its maximum height?

   d. What is the maximum height?

   e. About how high is the rocket after 6.5 seconds?



3) A rocket is launched from atop a 192 foot cliff with an initial velocity of 64 ft/s represented by the equation $h = -16t^2 + 64t + 192$.

a. What is the maximum height of the rocket?

b. How long will it take the rocke to reach it's maximum height?

c. How high is the rocket after 2.5 seconds?

d. How long will it take the rocket to hit the ground after it is launched?

4) You are trying to dunk a basketball. You need to jump 2.5 feet in the air to dunk the ball. The height that your feet are above the ground is given by the function $h = -16t^2 + 12t$.

a. What is the maximum height your feet will be above the ground?

b. Will you be able to dunk the basketball?

5) A diver is standing on a platform 24 feet above the pool. He jumps from the platform with an initial upward velocity of 8 ft/s. Use the formula $h = -16t^2 + 8t + 24$, where h is his height above the water, and t is the time. (Hint ... this problem is full of decimals!)

a. What is the maximum height of the diver?

b. How long did it take the diver to reach the maximum height?

c. How long will it take for him to hit the water?

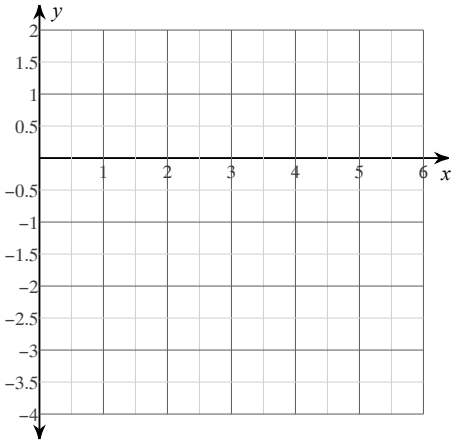
6) One of the games at a carnival involves trying to ring a bell with a ball by hitting a lever that propels the ball into the air. The height of the ball is modeled by equation $h = -16t^2 + 38t$.

a. What is the maximum height the ball will reach?

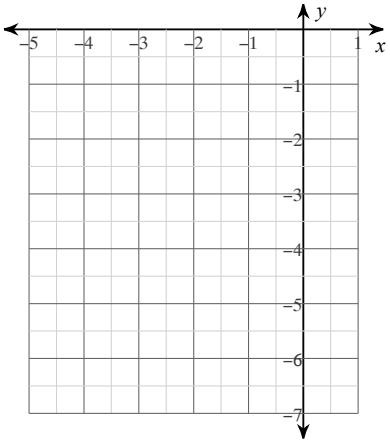
b. If the bell is 25 feet above the ground, will it be hit by the ball?

REVIEW (UNIT 5)
Graph each parabola:

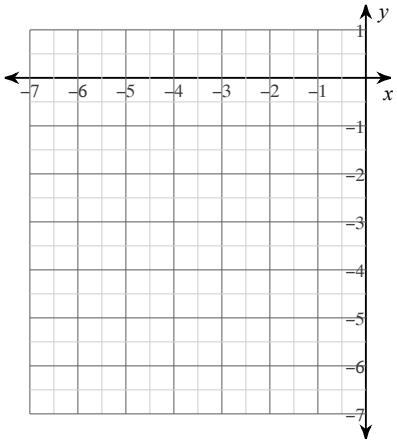
7) $y = (x-3)^2 - 3$



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



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



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