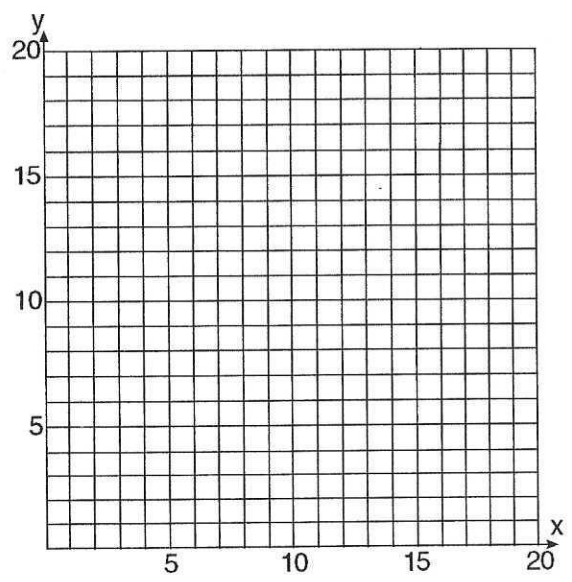


Name \_\_\_\_\_  
8A; Algebra 1

Date \_\_\_\_\_  
Period \_\_\_\_\_

Parabola Word Problems Homework

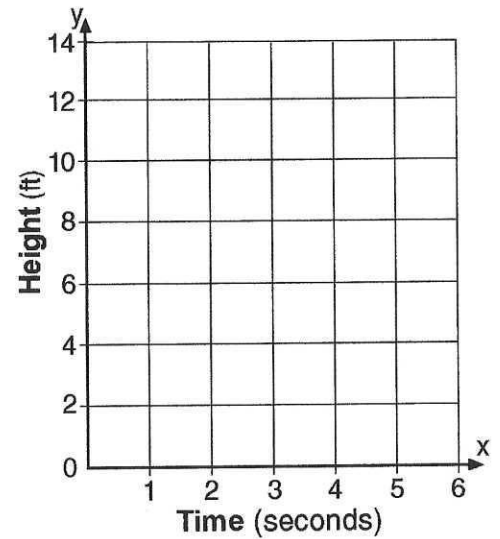
- 1) An arch is built so that it is 6 feet wide at the base. Its shape can be represented by a parabola with the equation  $y = -2x^2 + 12x$ , where  $y$  is the height of the arch.



- (a) Graph the parabola from  $x = 0$  to  $x = 6$ . [Show all work.]
- (b) Determine the maximum height,  $y$ , of the arch.

- 2) Amy tossed a ball in the air in such a way that the path of the ball was modeled by the equation  $y = -x^2 + 6x$ . In the equation,  $y$  represents the height of the ball in feet and  $x$  is the time in seconds.

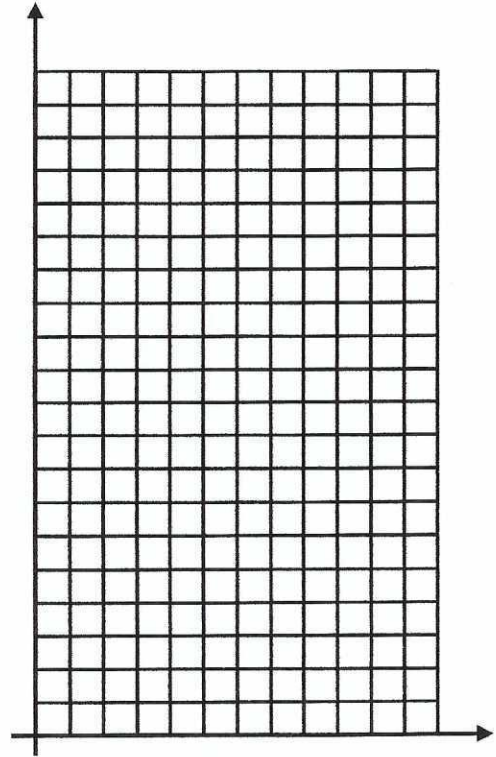
- (a) Graph  $y = -x^2 + 6x$  for  $0 \leq x \leq 6$ . [Show all work.]



- (b) At what time,  $x$ , is the ball at its highest point?

**Exercise # 3)** On top of a hill, a rocket is launched from a distance 80 feet above a lake. The rocket will fall into the lake after its engine burns out. The rocket's height,  $h$ , in feet above the surface of the lake is given by the equation,  $h = -16t^2 + 64t + 80$ , where  $t$  is time in seconds.

- (a) Graph  $h$  on your calculator for  $0 \leq t \leq 5$ .
- (b) What is the maximum height of the rocket?
- (c) How long does it travel upward before its engine burns out?
- (d) After how many seconds will the rocket hit the lake?



**4)** If a toy rocket is launched vertically upward from ground level with an initial velocity of 128 feet per second, then its height  $h$  after  $t$  seconds is given by the equation  $h(t) = -16t^2 + 128t$  (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?
- c. How long will it take the rocket to hit its maximum height?
- d. What is the maximum height?