

Name: \_\_\_\_\_

**UNIT 9**

Date: \_\_\_\_\_

**LESSON 4.5**

**Do Now:** Find the vertex algebraically.  $y = -6x^2 + 12x$

**Aim: Solving for the Vertex for Real Life Quadratic Functions**

1. Ms. Cronin and Mrs. Biscari are going to an amusement park. Their favorite ride is The Giant Trampoline. However, The Giant Trampoline is only allowed to be jumped once, per person. If the motion of Ms. Cronin's jump is represented by the equation  $h(t) = -12t^2 + 54t$ . Where  $t$  represents the time, in seconds and  $h(t)$  represents the height, in inches.

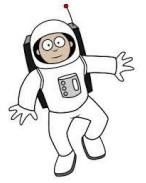


- a) How long does it take for Ms. Cronin to reach her maximum height?
- b) What is the maximum height that Ms. Cronin jumped?

2. Harrison is a football player for Calhoun Colts. He is the team's number one kicker. The winning field goal was made by him and is represented by the equation:  $p(x) = -6x^2 + 40x$ . Where  $p(x)$  is the height in yards and  $x$  is the time in seconds.
- (a) To the *nearest tenth* of a second, how long does it take for the football to reach its, maximum height?
- (b) To the *nearest tenth* of a yard, what is the maximum height of the football after the kick?
- (c) To the *nearest tenth* of a second, determine how long it takes for the football to touch the ground after it has been kicked?



- 3 Carly, as an American Astronaut, was working on a space station on the moon and decided to toss a moon rock into the air. The height of the moon rock is represented the by the equation  $h(t) = -2.7t^2 + 13t + 14$  Where  $t$  represents the number of seconds since the moon rock was tossed and  $h(t)$  represents the height of the moon rock in feet.
- a) To the *nearest hundredth* of a second, how long does it take for the moon rock to reach its maximum height?
- b) To the *nearest hundredth* of a foot, what is the maximum height of the moon rock?



- 4 Paul launched a model rocket from ground level. At  $t$  seconds after it is launched, it is  $h(t)$  meters above the ground, which is represented by the equation:  $h(t) = -4.9t^2 + 68.8t$ .
- a) To the nearest second, how long does it take the model rocket to reach its maximum height?
- b) To the nearest meter, what is the maximum height, attained by the model rocket?



1. Graph the function  $y = x^2 - 8x + 7$

a) Determine the direction the parabola.

b) Identify the minimum point.

c) What is Axis of Symmetry?

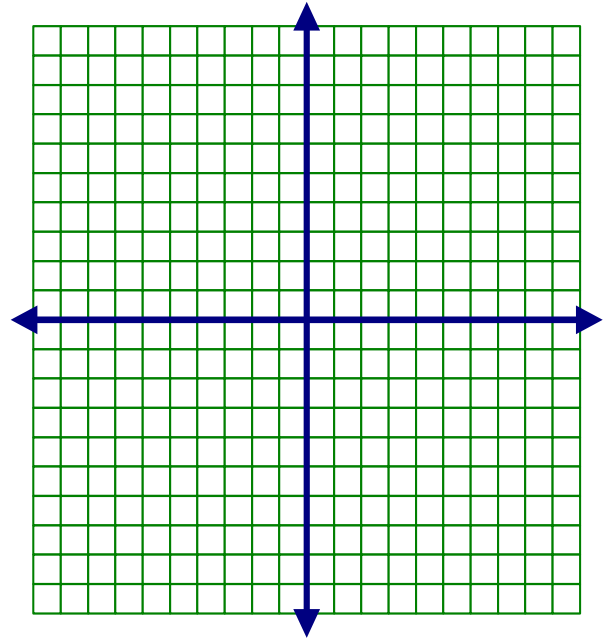
d) Identify the x-intercepts.

e) Identify the y-intercept.

f) State the increasing interval.

g) State the decreasing interval.

$x$	$y$



2. At a Bellmore-Merrick swim meet, Ryan dives from a diving board. His position above the water is represented by the equation:  $f(x) = -16x^2 + 24x + 40$ . Where  $x$  represents the time in seconds and  $f(x)$  represents the height, in feet above the water.

(a) How long does it take for Ryan to reach his maximum height?

(b) What is Ryan's maximum height?



