

# THROWING & DROPPING STUFF

## READ AND DISCUSS WITH GROUP.

We have seen that the graph of a quadratic equation will create a parabola. We have also seen how a parabola can be used to model real world situations. When an object is thrown upward in the air, its height over time forms the shape of a parabola. In fact a format can be used to create the equation. Study the parts of the equation below.

$$y = -\boxed{16}x^2 + \boxed{\phantom{00}}x + \boxed{\phantom{00}}$$

Force of gravity  
(Use 16 if you are  
measuring in feet)

Initial Velocity (ft/s)

Initial Height in feet

Let's say you are throwing a ball into the air. You launch it at a velocity of 20 ft/s. Its initial height is 5 feet. Its equation would look like this:

$$y = -16x^2 + 20x + 5$$

**Graph it by creating a table of values or with your calculator.** The independent variable is seconds, and the dependent variable is height in feet.

What is the initial velocity if you just drop an object? 0! Therefore the middle term in the equation would not be needed. If you drop a ball from a height of 5 feet, its equation looks like this:

$$y = -16x^2 + 5$$

**Graph it by creating a table of values or with your calculator.** The independent variable is seconds, and the dependent variable is height in feet.

**Why is the graph not linear?**

Spread out the cards. Match each story with an equation and with a graph. Discuss the features of the graphs with your group.

## MATCHING CARDS SET 1

A

$$y = -16x^2 + 32x + 64$$

B

$$y = -16x^2 + 64x + 32$$

C

$$y = -16x^2 + 64$$

D

$$y = -16x^2 + 32$$

E

A person drops a penny from a building window 64 feet above ground.

F

While standing in the stands, a baseball player hits a baseball towards the sky with a velocity of 64 ft/s from a height of 32 feet.

G

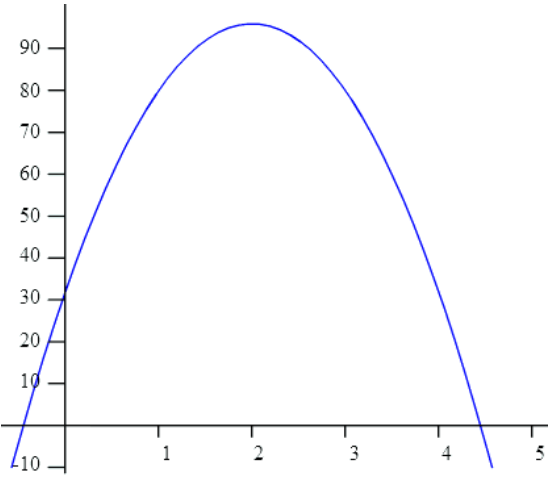
A person free falls from a diving board into a pool 32 feet below.

H

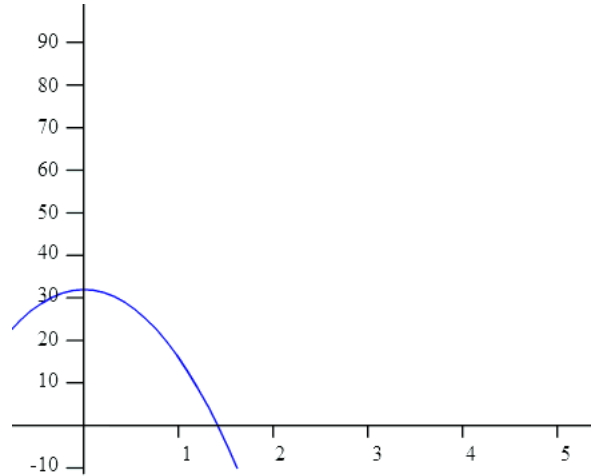
A juggling clown on a tight rope throws a ball from 64 feet in the air upward with a velocity of 32 ft/s.

# MATCHING CARDS, SET 2

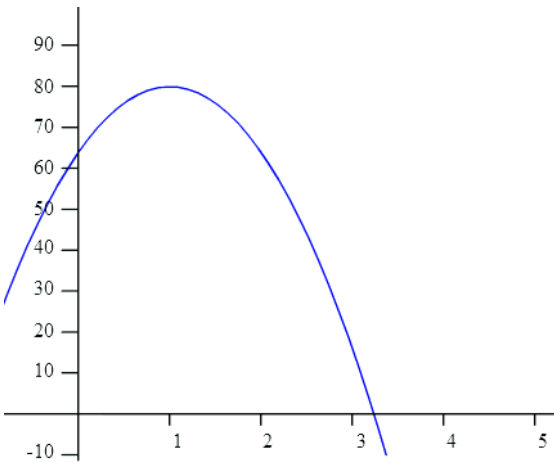
I



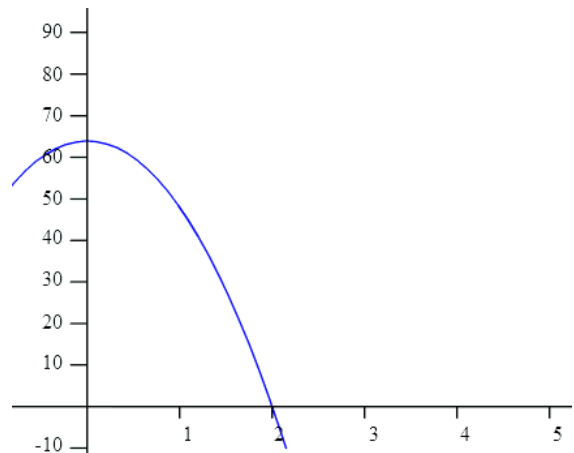
J



K

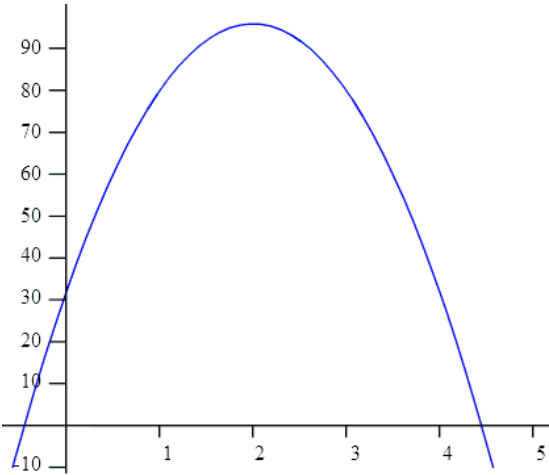


L

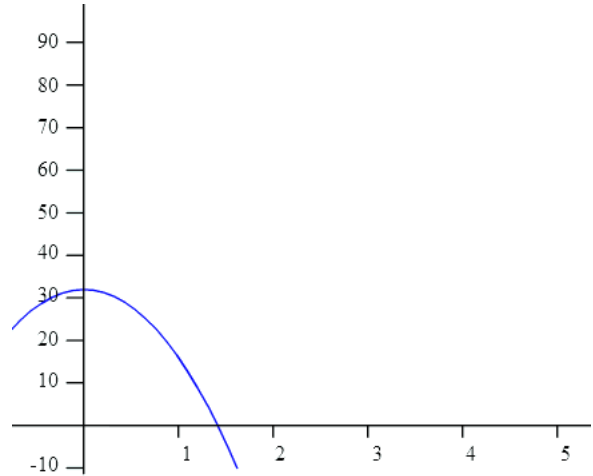


# MATCHING CARDS ANSWERS

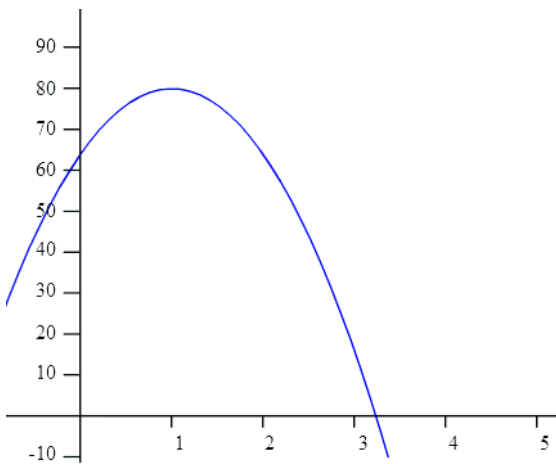
**B, F, I**



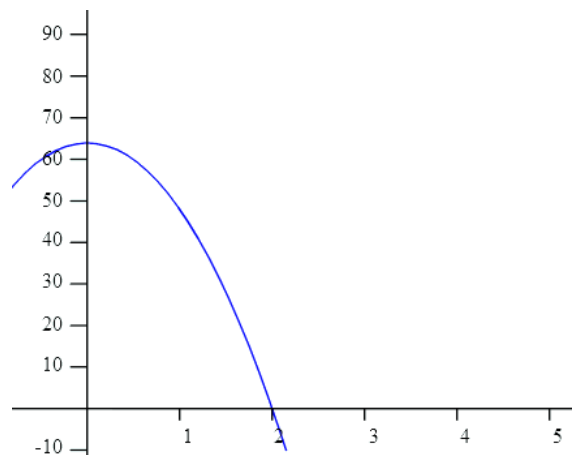
**D, G, J**



**A, H, K**

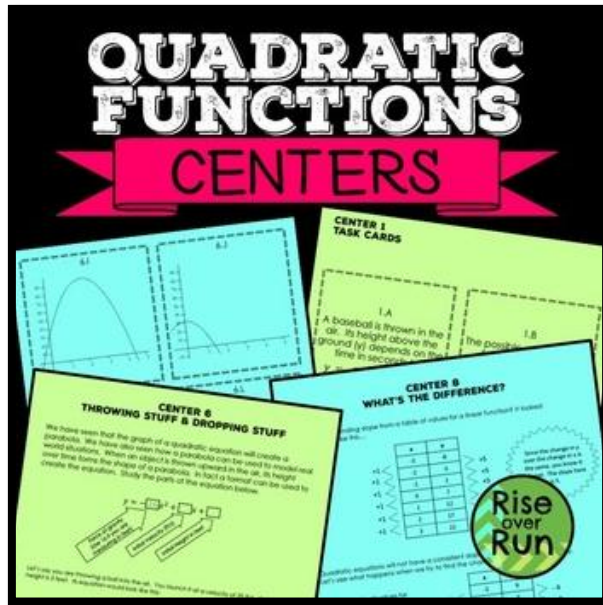


**C, E, L**

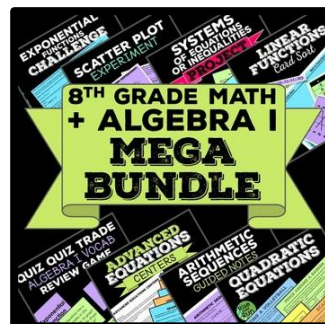
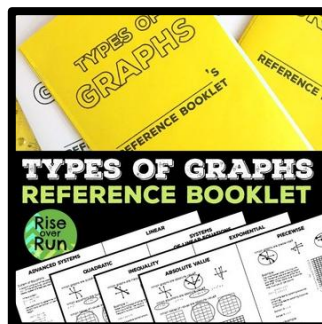
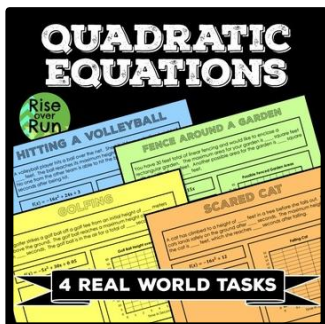


Like this activity?

This activity is just one activity in my [Quadratic Functions Centers](#).



Check out these other suggested resources!



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<https://www.teacherspayteachers.com/Store/Rise-over-Run>

