Warm-Up:

Learning Target

1. I can graph real life scenarios describing a quadratic function.
2. I can answer questions regarding real life scenarios using a quadratic function.

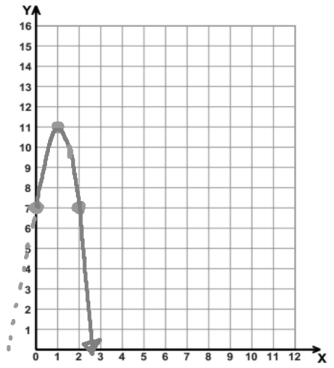
Example 1: Quadratics in Real Life

x = time y = height

Johnny throws a tennis ball as far as he can. We have the following formula $f(x) = -4x^2 + 8x + 7$ expressing a function of t, where x represents the number of seconds since the tennis ball left Johnny's hand and f(x) represents the height of the tennis ball in feet.

↓ y

1. Graph the Equation:
2. Identify the y-intercept: (0, 7)
3. Identify the vertex: (1, 11)



It should not go outside of the first quadrant. Why?

At what time is the tennis ball the highest in the air?

x = time 1 second

How high is the tennis ball when it is the highest in the air? y = height 11 ft

After 1.5 seconds, is the ball going up or down?

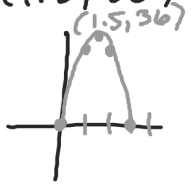
After 0.5 seconds, is the ball going up or down?

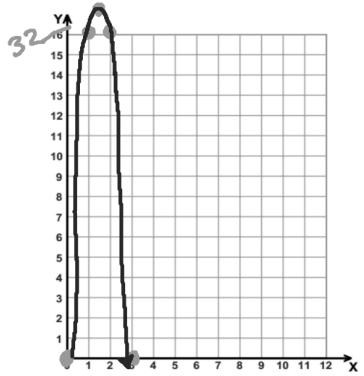
After 1 second, is the ball going up or down? neither b/c I'm at the highest point.

Example 2: Quadratics in Real Life

A soccer ball is kicked by a super hero. We have the following formula expressing a function of t, $f(t) = -16t^2 + 48t$ where t represents the number of seconds since the soccer ball left the ground and f(t) represents the height of the ball in feet.

1. Graph the Equation:
2. Identify the y-intercept: (0, 0)
3. Identify the vertex: (1.5, 36)





How high is the soccer ball at it's highest point?

36 ft.

At what time is the soccer ball at it's highest point?

1.5 sec.

Is the ball going up or down after 2 seconds?

Down.

How high is it at 2 seconds? 32ft.

lete problems 1-5. You MUST draw a sketch with every question that accurately sents the problem.

Bobby hits a golf ball. The following function models the height, f(x), in feet, of an object x seconds after it is hit in the air: $f(x) = -16x^2 + 96x$. What time is the golf ball highest in the air and how high is it?

Jason Heyward hits a baseball. The following function models the height, h(t), in feet, of an object t seconds after it is in the air: $f(t) = -16t^2 + 64t + 3$. What is the highest the baseball will go? Is the baseball going up or going down after 2.5 seconds?

A shoe is thrown off a cliff. The following function models the height, f(x), in feet, of an object x seconds after is in the air: $f(x) = -16x^2 + 24x + 150$. Is the shoe going up, down, or at its highest point after 3 seconds? How high is it after 3 seconds?

Bozo the clown is shot out of a human canon at the circus. The following function models the height, h(t), in feet, of an object t seconds after it is in the air: $f(t) = -16t^2 + 32t + 5$. Is Bozo going up or down after 2 seconds? How high off the ground is he after 2 seconds?

A nerf gun shoots a foam dart into the air. The following function models the height, f(x), in feet, of an object x seconds after it is in the air: $f(x) = -16x^2 + 16x + 6$. Is the foam dart going up or down after 1 second? How high is the foam dart at 2 seconds? Can this happen?

TOTD

Are you Green, Yellow, or Red today? (bubble in)

$y = -16t^2 + 3500$

Jane went sky diving and jumped out of the air plane at 3500 ft. Using the given function, approximate how many seconds it would take for her to hit the ground if her parachute failed.