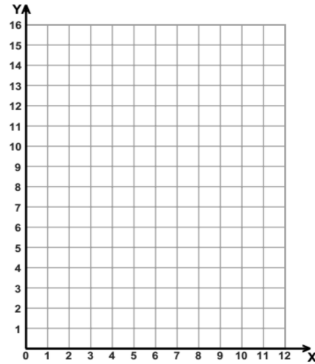


### Example 1: Quadratics in Real Life

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.

1. Graph the Equation:
2. Identify the y-intercept:
3. Identify the vertex:



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

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

How high is the tennis ball when it is the highest in the air?

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

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

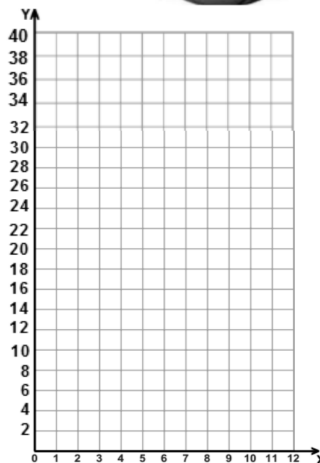
After 1 second, is the ball going up or down?

### 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:
3. Identify the vertex:



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

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

Is the ball going up or down after 2 seconds?

How high is it at 2 seconds?