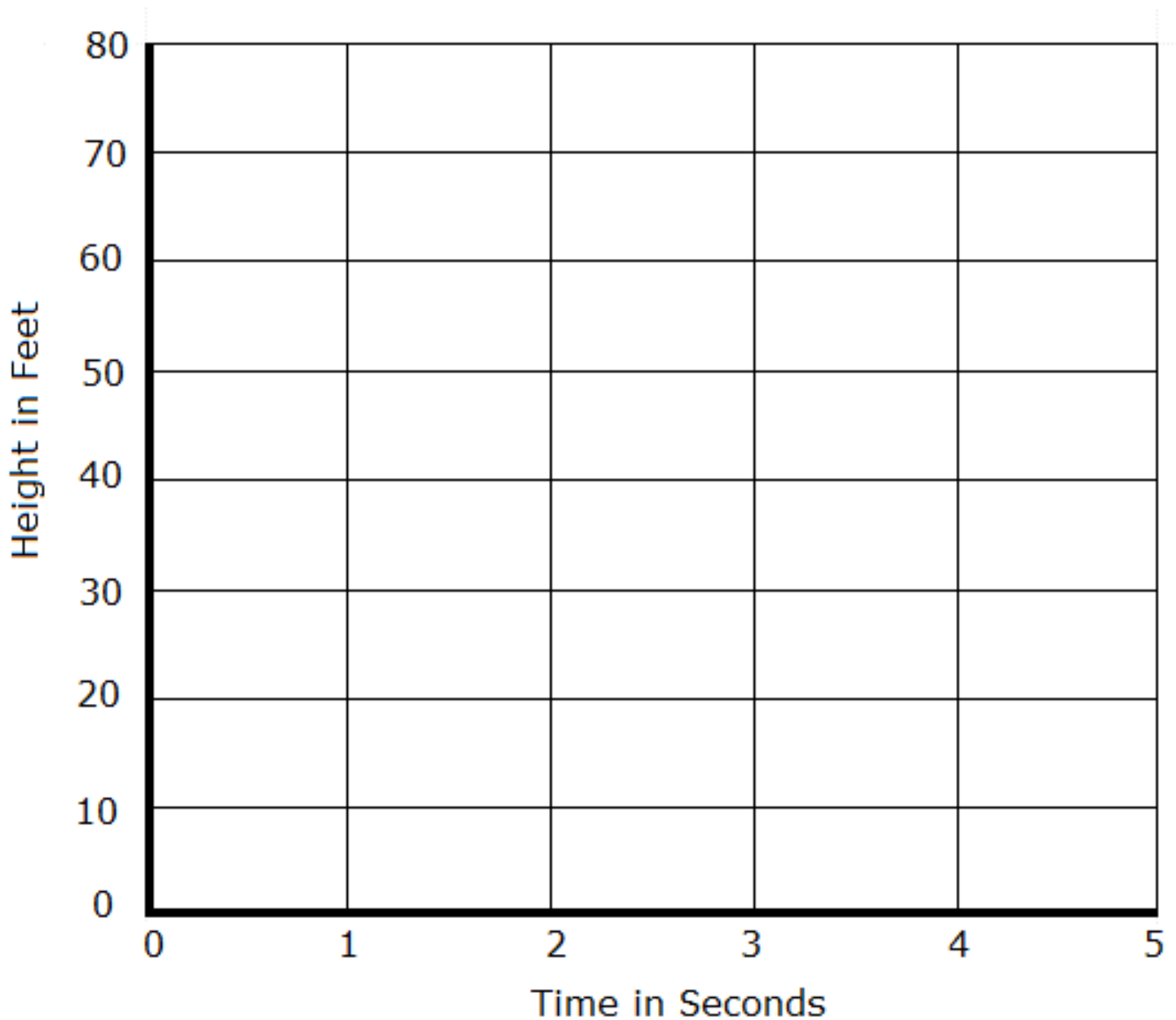


Height of a Ball



A baseball batter pops a ball straight up. The ball reaches a height of 68 ft before falling back down. Roughly 4 s after it is hit, the ball bounces off home plate. Make a sketch of a graph that models the ball's height in feet during its flight time in seconds. When is the ball 68 ft high? How many times will it be 20 ft high?

Points to Observe About the Graph

When the bat hits the ball, it is a few feet above the ground. So the y-intercept is just above the origin.

The ball's height is 0 when it hits the ground just over 4 s later. So the parabola crosses the x-axis near the coordinates (4, 0).

The ball is at its maximum height of 68 ft after about 2 s, or halfway through its flight time.

So the vertex of the parabola is near (2, 68).

The ball reaches a height of 20 ft twice—once on its way up and again on its way down.