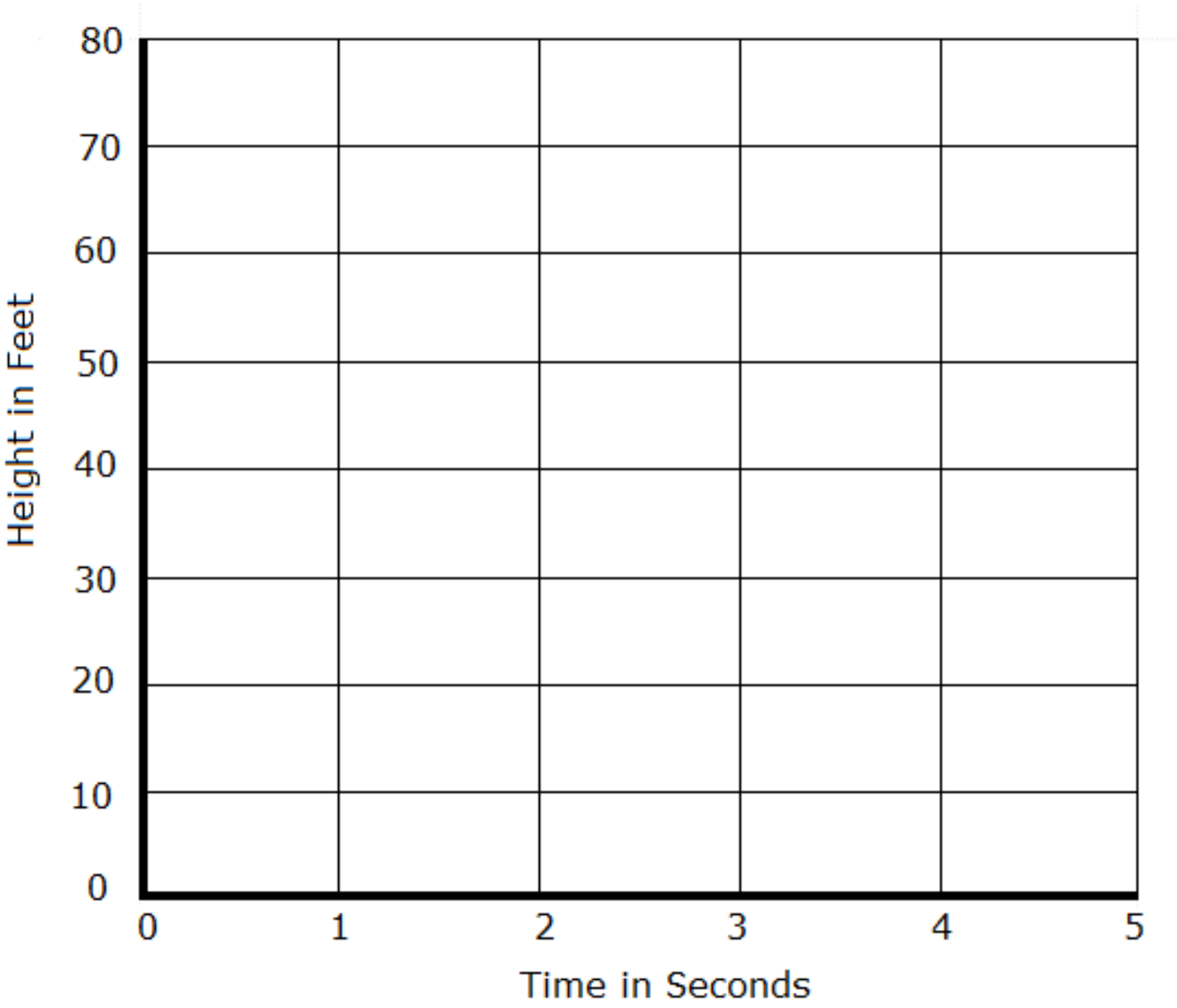
Height of a Ball



A baseball batter, six foot tall, pops a ball straight up. The ball reaches a height of 70 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 70 ft high? Label this point on the graph. How many times will it be 20 ft high? Label these points on the graph.

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. What did you choose for the y-intercept?
- 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). Label this point on your graph.
- The ball is at its maximum height of 70 ft after about 2 s, or halfway through its flight time. This point is called the vertex of the parabola and is near (2, 70).
- The ball reaches a height of 20 ft twice—once on its way up and again on its way down.