

NAME: _____

Football: Field Goals and Functions

The University of Texas at San Antonio has developed a football kicking simulator to help football players make improvements and reduce injury.

Check out: <https://youtu.be/usWRg1-Mtqs>

1. According to data collected from the simulator involving cameras and a radar gun, a particular kicker kicks the ball straight at an average speed of 19 m/s or 43 mph with the ball traveling at a 40 degree angle. The simulator then determines the average maximum height that the kicker can kick the ball from the ground to be 25 feet with an average maximum distance of 120 ft.
 - a. Sketch a rough sketch of the path of the ball when kicked.

 - b. Identify 3 points:
 - i. Initial point in which the ball was kicked.

 - ii. Vertex (location of the highest point)

 - iii. Landing Point

 - c. Model the path of the ball as a function $f(x)$ where x is the horizontal distance and $f(x)$ is the vertical distance.

2. Using the function that you created in #1c, and knowing that the field goal in football consists of a crossbar 10 feet above the ground in which a ball must go above, answer the following:
- In a game, the kicker is going to attempt a 25-yard field goal which is ____ feet.
Determine the height of the ball at the distance of the field goal. Will the ball go through the field goal?
 - In a game, the kicker is going to attempt a 30-yard field goal which is ____ feet.
Determine the height of the ball at the distance of the field goal. Will the ball go through the field goal?
 - In a game, the kicker is going to attempt a 35-yard field goal which is ____ feet.
Determine the height of the ball at the distance of the field goal. Will the ball go through the field goal?
 - In a game, the kicker is going to attempt a 40-yard field goal which is ____ feet.
Determine the height of the ball at this distance. Will the ball go through the field goal?