

1. A baseball is hit when the ball is 3 feet above the ground. It leaves the bat with an initial velocity of $(152) v_0$ ft/sec and at an angle of elevation of (20°) . A 20 foot fence is 400 feet from home plate. Will the ball make it over the fence?

a. Use parametric equations to represent the flight of the ball.

$$X = 152T \cos(20^\circ)$$

$$y = -16T^2 + 152T \sin(20^\circ) + 3$$

$$x_{min} = 0$$

$$x_{max} = 475$$

$$y_{min} = 0$$

$$y_{max} = 50$$

b. Use the equations and your calculator to determine if it is a homerun.

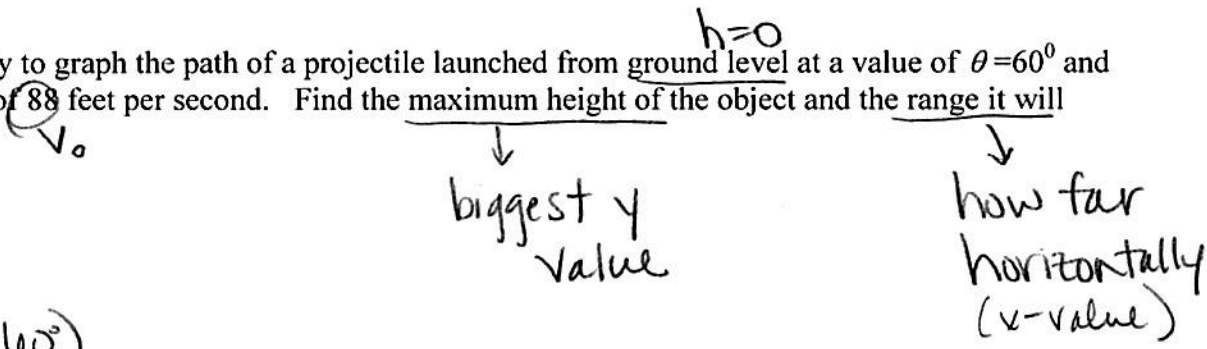
Want over fence!

$$x_2 = 400$$

$$y_2 = 20$$

Yes, ball went over fence

2. Use a graphing utility to graph the path of a projectile launched from ground level at a value of $\theta = 60^\circ$ and with an initial velocity of 88 feet per second. Find the maximum height of the object and the range it will travel.



$$X = 88T \cos(60^\circ)$$

$$y = -16T^2 + 88T \sin(60^\circ)$$

max height = 90.7 ft
 travel range = b/w 206.8 - 211.2 ft

(Over)

3. A soccer player determines that she consistently kicks the ball at an angle of 30° degrees, with an initial velocity of $25 \text{ m}^2/\text{sec}$. How far is the ball from the soccer player when it hits the ground?
- assume $h=0$
- v_0 biggest x-value

$$x = 25T \cos(30^\circ)$$
$$y = -10T^2 + 25T \sin(30^\circ)$$

blw 15.1 - 17.3 m

4. Determine whether a baseball hit with an initial velocity of $115 \text{ ft}^2/\text{sec}$ at a launch angle of 45° degrees will clear a four foot fence 400 feet from home plate. Assume that the ball is hit when its height is 4 feet from the ground.
- v_0 θ
 h

$$x = 115T \cos(45^\circ)$$
$$y = -16T^2 + 115T \sin(45^\circ) + 4$$

$$x_2 = 400$$

$$y_2 = 4$$

want over fence!

Yes, ball cleared fence