

2-11 : Projectile Motion

givens

$$V_0 = 28 \text{ m/s}$$

$$\text{ang} = 68^\circ$$

$$y_0 = .8 \text{ m}$$

$$x_0 = 0 \text{ m}$$

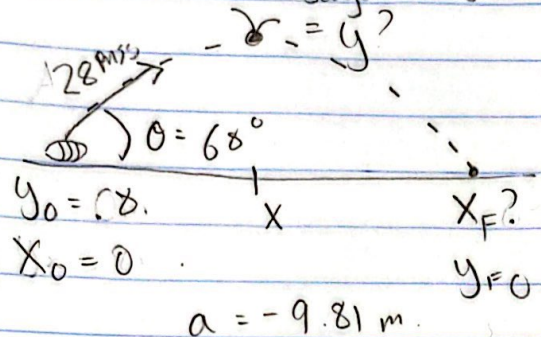
$$V_y = 0 \text{ m/s}$$

Exercise.

- Find Velocity of the football when it hits the seagull
- Find the height of the seagull when it was hit
- Find the distance between the punter and the seagull is hit.

given a punt of 28 m/s at an angle of 68°
leaves his foot at .8 m above the ground
ignore air resistance!

seagull was an alabamian fan don't feel bad!



Find V_y at highest point.

then find the $y = h$ at the top!

find x when bird got hit.

A) speed.

$$V_{0x} = V_0 \cos \theta \quad |V| = \sqrt{V_x^2 + V_y^2}$$

$$V_{0y} = V_0 \sin \theta$$

$$V_x = 28 \cos 61 = 13.57 \text{ m/s} \quad V_y = -0.81$$

$$\sqrt{(13.57)^2 + (0)^2} = \boxed{13.57 \text{ m/s}}$$

$$B) \quad y = .8 + \left(\frac{0^2 - 24.48^2}{2(-9.81)} \right) = \boxed{31.36 \text{ m}}$$

C) X position.

$$x = x_0 + (V_{0x} \Delta T) = 28 \cos 61 \cdot 2.45 \text{ seconds}$$

$$V_y = V_{0y} + -9.81(t)$$

$$\boxed{= 34.5 \text{ m/s}}$$

$$t = \frac{V_y - V_{0y}}{-9.81} = \frac{0 - 24.48}{-9.81}$$