

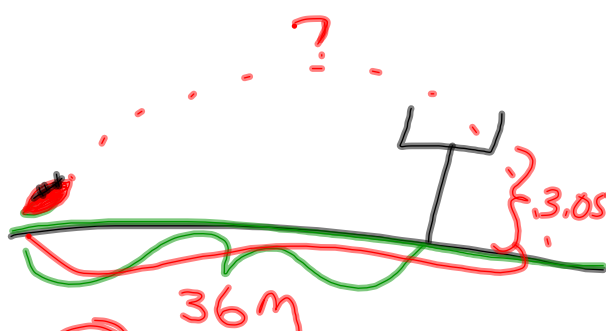
Physics Problem Solving Sheet

Problem

pg 110 35

Useful Description

Picture & Given Information:



$$\Delta y = ?$$

$$v_{iy} =$$

$$v_{fy} =$$

$$g = -9.8 \frac{m}{s^2}$$

$$\Delta x = 39.23$$

$$v_x = 12.05$$

$$v_i = 20 \frac{m}{s} @ 53^\circ \text{ North}$$

$$\Delta t = ?$$



Question:

$$v_x = 20 \frac{m}{s} \cos 53^\circ = 12.05$$

$$v_{iy} = 20 \frac{m}{s} \sin 53^\circ = 16.0 \frac{m}{s}$$

Target Quantity:

Physics Approach

Physics Concepts and/or Principles:

x : const v
 y : const acc.

Specific Application of Physics

Assumptions/ Constraints:

no air res.

Specific Equations:

$$\Delta x = \frac{v_i^2 \sin(2\theta)}{g}$$

$$\Delta x = v_x t$$

Mathematical Procedures

Employ specific equations to solve for target quantity

$$\Delta x = \frac{(20 \frac{m}{s})^2 \sin(2 \times 53^\circ)}{9.8 \frac{m}{s^2}} = 39.23 m$$

$$\Delta y = \frac{1}{2} a t^2 + v_{iy} t$$

$$= \frac{1}{2} (-9.8 \frac{m}{s^2}) (3.5)^2 + 16.0 \frac{m}{s} (3.5) = 3.9 m$$

$$\Delta t = \frac{\Delta x}{v_x} = \frac{36 m}{12 m/s} = 3 s$$

Check units & calculate