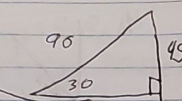


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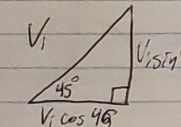
1. $X_f = v_{ix}(t)$ $\frac{11}{114.3 \text{ mps} = 77.9 \text{ mps}}$ 

$y_f = -16t^2 + 45t$ $t = 2.3 \text{ seconds}$

$114.3(2.3) = 262.9 \text{ ft} \rightarrow \text{short}$

$114.3(2.9) = 331.5 \text{ ft} \rightarrow \text{hits the fence } 1.5 \text{ ft above}$

2. $40 \text{ yd} = 120 \text{ ft}$



$X_f = v_{ix} t \rightarrow v_{ix} = v_{iy} = \frac{t}{120}$

$y_f = -16.1 t^2 + v_{iy} t - 10$

$y_f = -16.1 t^2 + \left(\frac{t}{120}\right) t - 10$

$t = \frac{120}{v_i \cos(45)} \rightarrow y_f = -16.1 \left(\frac{120}{v_i \cos(45)}\right)^2 + v_i \cos(45) \left(\frac{120}{v_i \cos(45)}\right) - 10$

$0 = -16.1 \left(\frac{120}{v_i \cos(45)}\right)^2 + v_i \cos(45) \left(\frac{120}{v_i \cos(45)}\right) - 10$

$v_i \cos(45) = 45.9 \text{ ft/s}$

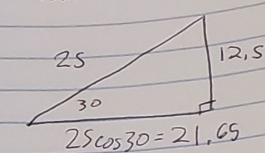
$\sqrt{2(45.9^2)} = \sqrt{4213.62} = 64.9 \text{ ft/s}$

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3. $v_i = 25 \text{ m/s}$ $\theta = 30^\circ$ $v_{\text{stan}} = 8 \text{ m/s}$

$x_f = -49t^2 + 12.5t$

$t = 2.55 \text{ sec}$

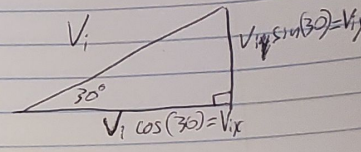


$v_{ix}(t) = x_f = 55.21 \text{ m}$

$v_{\text{stan}}(t) = 20.4 \text{ m}$

$55.21 + 20.4 = 75.61 \text{ m}$

4. $y_i = 3, x_i = 0$ $x_f = 6$



$0 = -4.9t^2 + v_{iy} t + 3$

$6 = v_{ix} t + 0 \rightarrow t = \frac{6}{v_{ix}}$

$v_i^2 - v_i^2 \cos(30) - 176.4 = 0$

$0 = -4.9 \left(\frac{6}{v_i \cos(30)}\right)^2 + v_i \sin(30) \left(\frac{6}{v_i \cos(30)}\right) + 3$

$\left(\frac{-4.9}{1}\right) \left(\frac{6}{v_i \cos(30)}\right)^2 + \left(\frac{6}{v_i \cos(30)}\right) + \frac{3}{1}$

$\frac{-176.4}{v_i^2 \cos(30)} + \frac{3v_i}{v_i^2 \cos(30)} + \frac{3}{1} = 0$

$\frac{3v_i^3 - 176.4}{v_i^2 \cos(30)} = \frac{-3}{1}$

$\frac{3v_i}{\cos(30)} \cdot \frac{v_i^2}{v_i^2} = \frac{3v_i^3}{v_i^2 \cos(30)}$

$\frac{3v_i^3 - 176.4}{3} = \frac{-3v_i^2 \cos(30)}{3} \rightarrow v_i^3 - 176.4 = v_i^2 \cos(30)$