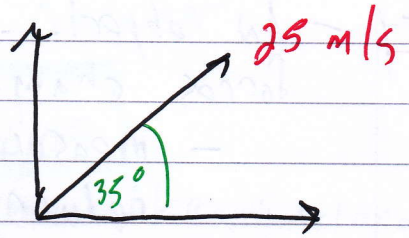
PT 1420
Syllabus - see Slides
~ 5% per night
~ Exams 25% each

Wk 1

ITT Tech
49 54 54 20 54 65 63 68

Arrow Problem
Ex 2
Pg 120

Baseball hit
Velocity = 25 m/s
angle = 35°



a) what are V_x, V_y

$\cos 35° = a/H$

$V_x = 25 \cos 35 = (25)(.819) = 20.47$ m/s

$V_f = 25 \sin 35 = (25)(.57) = 14.3$

b) y component is how long ball in air

$$t = \frac{V_{yf} - V_{yi}}{a_y} \Rightarrow \quad - \uparrow \downarrow +$$

NOTE: $V_f = V_i + at$

$$= \frac{14.3 \text{ m/s} - (-14.3) \text{ m/s}}{9.8 \text{ m/s}^2} = \frac{28.6}{9.8} \text{ s} = 2.9 \text{ s}$$

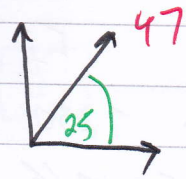
c) Now for x

$(V_x)(t) = (2.91)(20.47) = 59.6$

(book shows 59.9 - rounding)

Arrow Problem

Target is 60 feet away



$V_y = 47 \sin 25$

$= (47)(.4.22) = 19.46$ ft/s

$V_x = 47 \cos 25 =$

$= (47)(.90) = 42.59$ ft/s

$v_f = v_i + at$

Time in air $= \dfrac{v_f - v_i}{a}$

$= \dfrac{[19.46 - (-19.46)]\ m/s}{9.8\ m/s^2}$ ft/s $= \dfrac{39.72}{9.8} = 4.05$ s

$= \dfrac{39.72\ f/s}{32 ft/s^2} = 1.23$ seconds

Distance Traveled = (time in air) [speed in direction of target]

$= (1.23 s)\ 42.59\ ft/s = 52.38$ ft

Arrow falls short