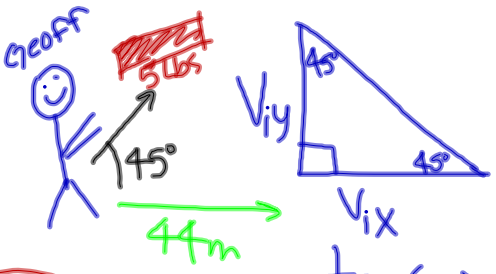


$\tan(45) = \frac{V_{iy}}{V_{ix}}$

$V_{ix} = \frac{44}{t}$

$V_{iy} = 4.9t$

$\tan 45 = \frac{V_{iy}}{V_{ix}}$

$1 = \frac{4.9t}{\frac{44}{t}}$

$\Delta x = 44 = V_{ix} \cdot T$

$\Delta y = 0 = V_{iy} \cdot T + \frac{1}{2}(-g)T^2$

$0 = T(V_{iy} - 4.9T)$

$V_{iy} - 4.9t = 0$

$V_{iy} = 4.9t$

$\tan 45 = 1 = \frac{4.9t}{\frac{44}{t}} = \frac{4.9t}{1} \times \frac{t}{44} = \frac{4.9t^2}{44}$

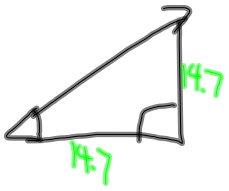
$44 = 4.9t^2$

$\sqrt{t^2} = \sqrt{8.98}$

$t = 3s$

$V_{iy} = 4.9 \times 3 = 14.7$

$V_{ix} = \frac{44}{3} = 14.67$



$\sqrt{(14.7)^2 + (14.7)^2}$

$V_i = 20.8 m/s$

K	U
V_{ix}	Δy
V_{iy}	
g	
Δx	
0	
$V_{fy} = 0$	
$+$	

$0 = 14.7^2 + 2(-9.8)\Delta y$

$0 = 216.09 - 19.62\Delta y$

$+19.62\Delta y \quad +19.62\Delta y$

$\frac{19.62\Delta y}{19.62} = \frac{216.09}{19.62}$

$\Delta y = 11.01 m$

The NEW

$V_{iy} = 20.7$

$g = -9.81 m/s$

$\Delta y = ?$

$V_{fy} = 0$

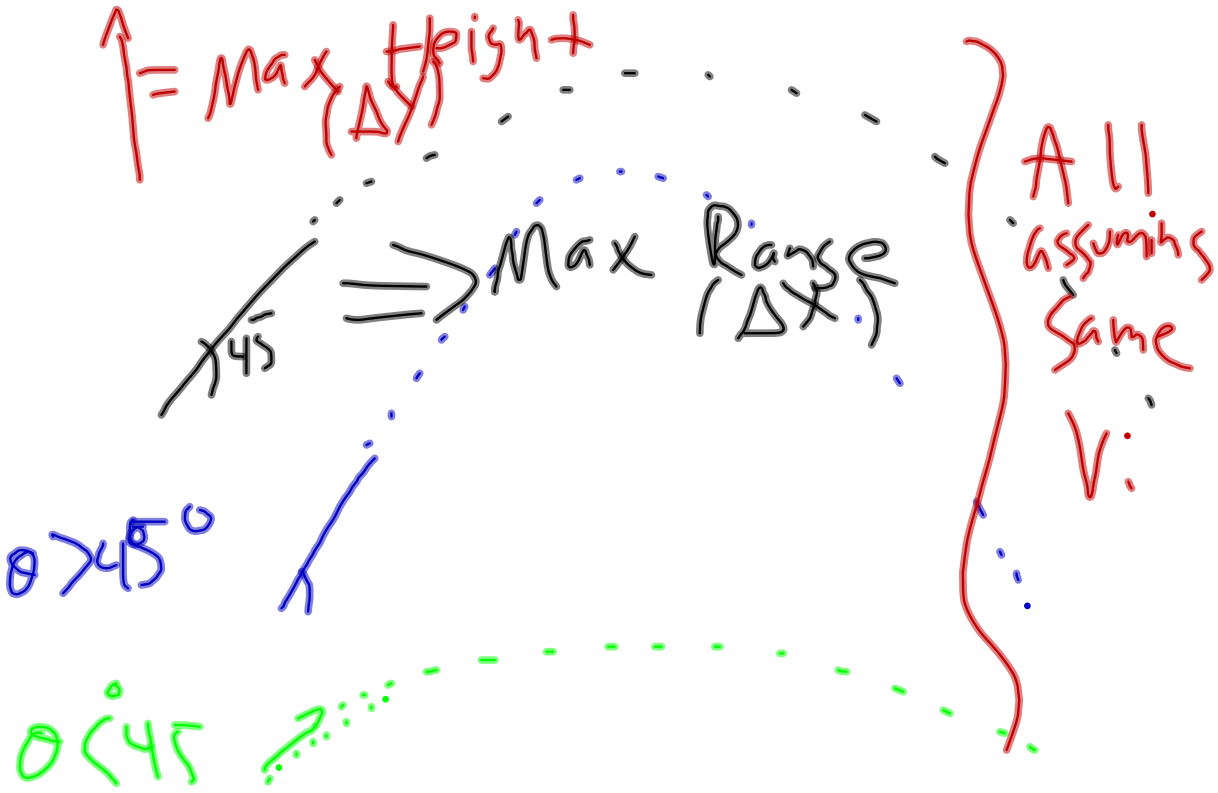
$$0 = 20.7^2 + 2(-9.81)\Delta y$$

$$0 = 428.49 - 19.62\Delta y$$

$+19.62\Delta y \qquad +19.62\Delta y$

$$\frac{19.62\Delta y}{19.62} = \frac{428.49}{19.62}$$ ☺

$\Delta y = 21.8$


= Max height (ΔY)
45
⟹ Max Range (ΔX)
All assuming same V.
θ > 45°
θ < 45