

física Semana 4

1) a- $V_{ox} = (9 \text{ m/s})(\cos 40^\circ) = 6.89 \text{ m/s}$
 $V_{oy} = (9 \text{ m/s})(\sin 40^\circ) = 5.79 \text{ m/s}$

$$t_s = \frac{V_{oy}}{g}$$

$$t_s = \frac{5.79 \text{ m/s}}{9.8 \text{ m/s}^2} = 0.59 \text{ seg}$$

$$H_{\max} = \frac{(-V_{oy})^2}{2g}$$

$$H_{\max} = \frac{(-5.79 \text{ m/s})^2}{2(-9.8 \text{ m/s}^2)} = 1.71 \text{ m}$$

$$y = 1.71 \text{ m} + 30 \text{ m} = 31.71 \text{ m}$$

$$t_c = \sqrt{\frac{2y}{g}}$$

$$t_c = \sqrt{\frac{2(31.71 \text{ m})}{9.8 \text{ m/s}^2}} = 2.54$$

$$t_v = t_s + t_c$$

$$t_v = 0.59 \text{ seg} + 2.54 = 3.13 \text{ seg}$$

$$x = V_{ox} t_v$$

$$x = (6.89 \text{ m/s})(3.13 \text{ seg})$$

$$x = 21.57 \text{ m}$$

2) a - $V_{oy} = (20 \text{ m/s})(\sin 37^\circ) = 12.03 \text{ m/s}$
 $H_{\max} = \frac{(-V_{oy})^2}{2g} = 24$

$H_{\max} = \frac{(-12.03 \text{ m/s})^2}{2(-9.8 \text{ m/s}^2)} = 24$

$H_{\max} = 7.38 \text{ m/s}$

b - $t_s = \frac{-V_{oy}}{g}$

$t_s = \frac{-12.03 \text{ m/s}}{-9.8 \text{ m/s}^2} = 1.23 \text{ sec}$

$t_v = 2t_s$

$t_v = 2(1.23 \text{ sec}) = t_v = 2.46 \text{ sec}$

c - $V_{ox} = (20 \text{ m/s})(\cos 37^\circ) = 15.97 \text{ m/s}$

$x = V_{ox} t_v$

$x = (15.97 \text{ m/s})(2.46 \text{ sec})$

$x = 39.29 \text{ m/s}$

3) a- $V_{0y} = (20 \text{ m/s})(\sin 50^\circ) = 15.32 \text{ m/s}$

$$t_s = \frac{-V_{0y}}{g}$$

$$t_s = \frac{-15.32 \text{ m/s}}{-9.8 \text{ m/s}^2} = 1.56 \text{ sec}$$

$$t_v = 2(1.56 \text{ sec})$$

$$t_v = 3.12 \text{ sec}$$

b- $H_{\max} = \frac{(-V_{0y})^2}{2g}$

$$H_{\max} = \frac{(-15.32 \text{ m/sec})^2}{2(9.8 \text{ m/s}^2)}$$

$$H_{\max} = 11.97$$

c- $V_{0x} = (20 \text{ m/s})(\cos 50^\circ) = 12.86 \text{ m/s}$

$$x = V_{0x} t_v$$

$$x = (12.86 \text{ m/s})(3.12 \text{ sec})$$

$$x = 40.12 \text{ m}$$

4) a- $V_{oy} = (20 \text{ m/s})(\sin 50^\circ) = 15.32 \text{ m/s}$

$$t_s = \frac{-V_{oy}}{g} = \frac{-15.32 \text{ m/s}}{-9.8 \text{ m/s}^2} = 1.56 \text{ sec}$$

$$t_s = \frac{-15.32 \text{ m/s}}{-9.8 \text{ m/s}^2} = 1.56 \text{ sec}$$

$$t_v = 2(1.56 \text{ sec}) = 3.12 \text{ sec}$$

$$t_v = 3.12 \text{ sec}$$

b- $H_{max} = \frac{(-V_{oy})^2}{2g}$

$$H_{max} = \frac{(-15.32 \text{ m/s})^2}{2(9.8 \text{ m/s}^2)} = 11.97 \text{ m}$$

$$H_{max} = 11.97 \text{ m}$$

c- $V_{ox} = (20 \text{ m/s})(\cos 50^\circ) = 12.86 \text{ m/s}$

$$X = V_{ox} T_v$$

$$X = (12.86 \text{ m/s})(3.12 \text{ sec})$$

$$X = 40.12 \text{ m}$$

d- $V_{oy} = (20 \text{ m/s})(\sin 40^\circ) = 12.86 \text{ m/s}$

$$t_s = \frac{12.86 \text{ m/s}}{9.8 \text{ m/s}^2} = 1.31 \text{ sec}$$

$$t_v = 2 t_s = 2(1.31 \text{ sec}) = 2.62 \text{ sec}$$

$$V_{ox} = (20 \text{ m/s})(\cos 40^\circ) = 15.32 \text{ m/s}$$

$$X = V_{ox} T_v = (15.32 \text{ m/s})(2.62 \text{ sec})$$

$$X = 40.14 \text{ m}$$

$$5) a = V_{oy} = (30 \text{ m/s}) (\sin 40) = 19.29 \text{ m/s}$$

$$t_s = \frac{-V_{oy}}{g} = \frac{-19.29 \text{ m/s}}{-9.8 \text{ m/s}^2} = 1.97 \text{ sec}$$

$$t_s = \frac{-19.29 \text{ m/s}}{-9.8 \text{ m/s}^2} = 1.97 \text{ sec}$$

$$t_v = 2t_s = 2(1.97 \text{ sec}) = 3.94 \text{ sec}$$

$$t_v = 2(1.97 \text{ sec}) = 3.94 \text{ sec}$$

$$t_v = 3.94 \text{ sec}$$

$$b - H_{\max} = \frac{(-V_{oy})^2}{2g} = \frac{(-19.29 \text{ m/s})^2}{2(9.8 \text{ m/s}^2)} = 18.98 \text{ m}$$

$$H_{\max} = \frac{(-19.29 \text{ m/s})^2}{2(9.8 \text{ m/s}^2)} = 18.98 \text{ m}$$

$$H_{\max} = 18.98 \text{ m}$$

$$c - V_{ox} = (30 \text{ m/s}) (\cos 40) = 22.98 \text{ m/s}$$

$$x = V_{ox} t_v = (22.98 \text{ m/s})(3.94 \text{ sec}) = 90.54 \text{ m}$$

$$x = (22.98 \text{ m/s})(3.94 \text{ sec}) = 90.54 \text{ m}$$

$$x = 90.54 \text{ m}$$

6) a- $V_{oy} = (40 \text{ m/s}) (\sin 45^\circ) = 28.28 \text{ m/s}$
 $t_s = \frac{-V_{oy}}{g}$

$$t_s = \frac{-28.28 \text{ m/s}}{-9.8 \text{ m/s}^2} = 2.86 \text{ sec}$$

$$t_v = 2t_s$$

$$t_v = 2(2.86 \text{ sec})$$

$$t_v = 5.77 \text{ sec}$$

b- $H_{\max} = \frac{(-V_{oy})^2}{2g}$

$$H_{\max} = \frac{(-28.28 \text{ m/sec})^2}{2(-9.8 \text{ m/sec}^2)}$$

$$H_{\max} = 40.80 \text{ m}$$

c- $V_{ox} = (40 \text{ m/s}) (\cos 45^\circ) = 28.28 \text{ m/s}$

$$x = V_{ox} t_v$$

$$x = (28.28 \text{ m/s})(5.77 \text{ sec})$$

$$x = 163.18 \text{ m}$$