

Semana 8

1) $Y = 80 \text{ m}$

$$V_{ox} = 30 \text{ m/s}$$

$$g = 9.8 \text{ m/s}^2$$

a) $t = \sqrt{\frac{2Y}{g}}$

$$t = \sqrt{\frac{(2)(80 \text{ m})}{9.8 \text{ m/s}^2}}$$

$$t = \sqrt{16.33 \text{ seg}^2}$$

$$\underline{t = 4.04 \text{ seg.}}$$

b) $X = V_{ox} t$

$$X = 30 \text{ m/s} \times 4.04 \text{ seg}$$

$$\underline{X = 121.2 \text{ m.}}$$

c) $V_x = V_{ox}$

$$V_{ox} \quad V_x = 30 \text{ m/s} \quad \text{componente horizontal}$$

$$V_y = gt$$

$$V_y = 9.8 \text{ m/s}^2 \times 4.04 \text{ seg}$$

$$V_y = 39.59 \text{ m/s}$$

$$V_R = \sqrt{(V_{ox})^2 + (V_y)^2}$$

$$V_R = \sqrt{(30 \text{ m/s})^2 + (39.59 \text{ m/s})^2}$$

$$V_R = \sqrt{2,467.37 \text{ m}^2/\text{seg}^2}$$

$$\underline{V_R = 49.67 \text{ m/s}}$$

$$2) V_{ox} = 198 \text{ km/h}$$

$$Y = 312 \text{ m}$$

$$g = 9.8 \text{ m/s}^2$$

$$a) t = \sqrt{\frac{2Y}{g}}$$

$$t = \sqrt{\frac{(2)(312 \text{ m})}{9.8 \text{ m/s}^2}}$$

$$t = \sqrt{63.67 \text{ sec}^2}$$

$$t = \underline{7.98 \text{ sec}}$$

$$b) X = V_{ox} t$$

$$X = 198 \text{ km/h} \cdot \frac{1,000 \text{ m}}{1 \text{ km}} = \frac{1 \text{ Hour}}{3,600} = \frac{198,000}{3,600} = 55 \text{ m/s}$$

$$X = 55 \text{ m/s} \times 7.98 \text{ sec}$$

$$X = \underline{438.9 \text{ m}}$$

$$3) V_{ox} = 80 \text{ m/s}$$

$$Y = 120 \text{ m}$$

$$g = 9.8 \text{ m/s}^2$$

$$a) t = \sqrt{\frac{2Y}{g}}$$

$$t = \sqrt{\frac{(2)(120 \text{ m})}{9.8 \text{ m/s}^2}}$$

$$t = \sqrt{24.49 \text{ sec}^2}$$

$$t = \underline{4.95 \text{ sec}}$$

$$b) X = V_{ox} t$$

$$X = 80 \text{ m/s} \times 4.95 \text{ sec}$$

$$X = \underline{396 \text{ m}}$$

4) $Y = 1,400 \text{ m}$

$V_{ox} = 140 \text{ m/s}$

$g = 9.8 \text{ m/s}^2$

a) $t = \sqrt{\frac{2Y}{g}}$

$t = \sqrt{\frac{2(1,400 \text{ m})}{9.8 \text{ m/s}^2}}$

$t = \sqrt{285.71 \text{ seg}^2}$

$t = 16.90 \text{ seg}$

b) $X = V_{ox} t$

$X = 140 \text{ m/s} \times 16.90 \text{ seg}$

$X = 2,366 \text{ m}$

c) $V_R = \sqrt{(V_x)^2 + (V_y)^2}$

$V_x = V_{ox}$

$V_y = gt$

$V_y = 9.8 \text{ m/seg}^2 \times 16.90 \text{ seg}$

$V_y = 165.62 \text{ m/seg}$

$V_R = \sqrt{(140 \text{ m/s})^2 + (165.62 \text{ m/seg})^2}$

$V_R = \sqrt{47,029.98 \text{ m}^2/\text{seg}^2}$

$V_R = 216.86 \text{ m/seg}$

5) a) $t_v = 2t_s$

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

$$V_{oy} = 15.32 \text{ m/s}$$

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

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

$$t_s = 1.56 \text{ seg}$$

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

$$\underline{t_v = 3.12 \text{ seg.}}$$

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

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

$$\underline{H_{\max} = 11.97 \text{ mts.}}$$

c) $X = V_{ox} t_v$

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

$$V_{ox} = 12.86 \text{ m/s}$$

$$X = 12.86 \text{ m/s} \times 3.12 \text{ seg}$$

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

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

$$V_{oy} = 12.86 \text{ m/s}$$

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

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

$$t_s = 1.31 \text{ seg}$$

$$t_v = 2t_s$$

$$t_v = (2) 1.31 \text{ seg}$$

$$t_v = 2.62 \text{ seg}$$

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

$$V_{ox} = 15.32 \text{ m/s}$$

$$X = V_{ox} t_v$$

$$X = 15.32 \text{ m/s} \times 2.62 \text{ seg}$$

$$\underline{X = 40.13 \text{ m}}$$

6) w) $V_{oy} = (30 \text{ m/s}) (\sin 40^\circ)$

$$V_{oy} = 19.28 \text{ m/s}$$

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

$$t_s = \frac{19.28 \text{ m/s}}{9.8 \text{ m/s}^2}$$

$$t_s = 1.97 \text{ sec}$$

$$t_v = 2 t_s$$

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

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

$$\underline{b) t_s = 1.97 \text{ sec}}$$

c)

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

$$H_{\max} = \frac{(-19.28 \text{ m/s})^2}{(2)(9.8 \text{ m/s}^2)}$$

$$\underline{H_{\max} = 18.97 \text{ m}}$$

d) $X = V_{ox} t_v$

$$V_{ox} = (30 \text{ m/s}) (\cos 40^\circ)$$

$$V_{ox} = 22.98 \text{ m/s}$$

$$X = 22.98 \text{ m/s} \times 3.94 \text{ sec}$$

$$\underline{X = 90.54 \text{ m}}$$

7)

$$V_t = 10 \text{ m/s}$$

$$r = 50 \text{ m}$$

$$a_c = ?$$

$$a_c = \frac{(V_t)^2}{R}$$

$$a_c = \frac{(10 \text{ m/s})^2}{50 \text{ m}}$$

$$\underline{a_c = 2 \text{ m/s}^2}$$

8)

$$V_t = 30 \text{ m/s}$$

$$R = 0.40 \text{ m}$$

$$\omega = ?$$

$$\omega = \frac{V_t}{R}$$

$$\omega = \frac{30 \text{ m/s}}{0.40 \text{ m}}$$

$$\underline{\omega = 75 \text{ rad/s}}$$

$$9) \underline{V_t = \frac{2\pi r}{T}}$$

$$10) \underline{T = \frac{t}{N}} \quad \underline{T = \frac{R \pi \text{ rad}}{\omega}}$$