

Semana 2

1) $r = 6,400 \text{ Km}$ $V_t = ?$ $t = 1 \text{ dia}$
 $T = 1 \text{ dia}$ $1 \text{ dia} = \frac{86,400}{1 \text{ dia}} = 86,400 \text{ seg.}$

$$T = \frac{86,400}{1} = 86,400 \text{ seg}$$

$$r = 6,400 \text{ Km} = \frac{6,400,000}{1 \text{ Km}} = 6,400,000 \text{ metros}$$

$$V_t = \frac{2\pi r}{T}$$

$$V_t = \frac{2(3.1416) 6,400,000 \text{ metros}}{86,400 \text{ seg}}$$

$$V_t = \underline{465.42 \text{ mt/seg}} = \underline{V_t = 1,675.52 \text{ Km/h}}$$

2) $r = 6,400,000 \text{ metros}$ $T = 86,400 \text{ seg}$ $\omega = ?$

$$\omega = \frac{2\pi \text{ rad}}{T}$$

$$\omega = \frac{2(3.1416) \text{ rad}}{86,400 \text{ seg}}$$

$$\omega = \underline{7.272 \times 10^{-5} \text{ rad/seg}}$$

3) $V_t = 90 \text{ Km/h}$ $R = 1.40 \text{ mt}/2 = 0.70 \text{ mt}$

$$90 \text{ Km/h} \cdot \frac{1,000 \text{ mt}}{1 \text{ Km}} = \frac{90,000}{3,600} = \frac{90,000}{3,600} = 25 \text{ mt/seg}$$

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

$$\omega = \frac{25 \text{ mt/seg}}{0.70 \text{ mt}}$$

$$\omega = \underline{35.71 \text{ rad/seg}}$$

$$4) n = 2,000 \quad t = 60 \text{ sec} \quad \theta = 720,000 \text{ grad}$$

$$\omega = \frac{\theta}{t}$$

$$\omega = \frac{720,000 \text{ grad}}{60 \text{ sec}}$$

$$\omega = 12,000 \text{ grad/sec}$$

$$5) n = 120 \quad t = 60 \text{ sec} \quad r = 3 \text{ m} / 2 = 1.5 \text{ m}$$

$$a) T = \frac{t}{n}$$

$$T = \frac{60 \text{ sec}}{120} =$$

$$T = 0.5 \text{ sec}$$

$$b) N = \frac{1}{T}$$

$$N = \frac{1}{0.5 \text{ sec}}$$

$$N = 2 \text{ rev/sec}$$

$$c) \omega = \frac{2\pi \text{ rad}}{T}$$

$$\omega = \frac{2(3.1416) \text{ rad}}{0.5 \text{ sec}}$$

$$\omega = 12.57 \text{ rad/sec}$$

$$d) v_t = \frac{2\pi r}{T}$$

$$v_t = \frac{2(3.1416) \times 1.5 \text{ m}}{0.5 \text{ sec}}$$

$$v_t = 18.85 \text{ m/sec}$$

$$e) a_c = \frac{v_t^2}{r}$$

$$a_c = \frac{(18.85 \text{ m/sec})^2}{1.5 \text{ m}}$$

$$a_c = 236.32 \text{ m/sec}^2$$

$$a_c = 236 \text{ m/sec}^2$$

6) $r = 1.2 \text{ m}$ $\omega = 35.4 \text{ rad/sec}$ 25

a) $V_t = \omega r$

$V_t = 35.4 \text{ rad/sec} \times 1.2 \text{ m} =$

$V_t = 42.48 \text{ m/sec}$

b) $A_c = \frac{V_t^2}{r}$

$A_c = \frac{(42.48 \text{ m/sec})^2}{1.2} = 1,503.8$

$A_c = 1,503.8$

7) $\theta = 2$

$t = 0.25 \text{ sec}$

$r = 30 \text{ cm}$

a) $\omega = \frac{\theta}{t}$

$\omega = \frac{2 \text{ rad}}{0.25 \text{ sec}}$

$\omega = 8 \text{ rad/sec}$

b) $V_t = \omega r$

$V_t = 8 \text{ rad/sec} \times 30 \text{ cm}$

$V_t = 240 \text{ cm/sec}$

c) $T = \frac{2\pi \text{ rad}}{\omega}$

$T = \frac{2(3.14) \text{ rad}}{8 \text{ rad/sec}} = 0.79$

d) $N = \frac{\omega}{2\pi}$

$N = \frac{8 \text{ rad/sec}}{2(3.14)}$

N

$$3/90$$

$$4/180$$

$$5/40$$

$$8) \quad r = 50 \text{ cm} \quad n = 400 \quad t = 5 \text{ min} = 300 \text{ sec}$$

$$a) \quad N = \frac{1}{T}$$

$$N = \frac{1}{0.75 \text{ sec}}$$

$$N = 1.33 \text{ rev/sec}$$

$$b) \quad T = \frac{t}{n}$$

$$T = \frac{300 \text{ sec}}{400} =$$

$$T = 0.75 \text{ sec}$$

$$c) \quad \omega = \frac{2\pi \text{ rad}}{T}$$

$$\omega = \frac{2(3.1416) \text{ rad}}{0.75 \text{ sec}}$$

$$\omega = 8.38 \text{ rad/sec}$$

$$V_t = \omega \cdot r$$

$$V_t = 8.38 \text{ rad/sec} \times 50 \text{ cm} \quad V_t = 418.88 \text{ cm/sec}$$

$$d) \quad A_c = \frac{V_t^2}{r}$$

$$A_c = \frac{(418.88 \text{ cm/sec})^2}{50 \text{ cm}} = \frac{175,460.45 \text{ cm}^2/\text{sec}^2}{50 \text{ cm}}$$

$$A_c = 3,509.21 \text{ cm/sec}^2$$