

Activitats. Moviment circular uniforme (MCU)

1)

- Busca horària tiga 12 h en per una volta ($2\pi \text{ rad}$)

$$12 \text{ h} \cdot \frac{3600 \text{ s}}{1 \text{ h}} = 43200 \text{ s}$$

$$\omega = \frac{\varphi}{t} = \frac{2\pi \text{ rad}}{43200 \text{ s}} = \left[\frac{\pi}{21600} \text{ rad/s} \right]$$

- Busca minuteru tiga 60 min en per una volta ($2\pi \text{ rad}$)

$$60 \text{ min} \cdot \frac{60 \text{ s}}{1 \text{ min}} = 3600 \text{ s}$$

$$\omega = \frac{\varphi}{t} = \frac{2\pi \text{ rad}}{3600 \text{ s}} = \left[\frac{\pi}{1800} \text{ rad/s} \right]$$

- Busca sekunder tiga 60 s en per una volta ($2\pi \text{ rad}$)

$$\omega = \frac{\varphi}{t} = \frac{2\pi \text{ rad}}{60 \text{ s}} = \left[\frac{\pi}{30} \text{ rad/s} \right]$$

2)

33,5 rpm $\rightarrow$ rad/s

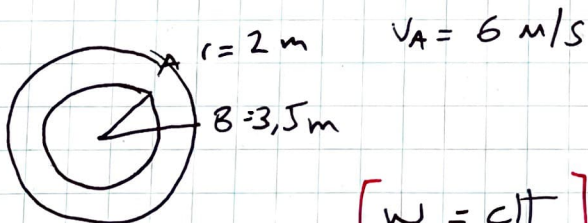
$$\frac{33,3 \text{ rev}}{\text{min}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} \cdot \frac{1 \text{ min}}{60 \text{ s}} = \left[3,5 \text{ rad/s} \right]$$

$$r = 15 \text{ cm} \cdot \frac{1 \text{ m}}{100 \text{ cm}} = 0,15 \text{ m}$$

$$v = \omega \cdot r$$

$$v = 3,5 \cdot 0,15 = \left[0,523 \text{ m/s} \right]$$

3)



$$v_A = \omega \cdot r_A$$

$$6 = \omega \cdot 2$$

$$\omega = 3 \text{ rad/s}$$

$$v_B = \omega \cdot r_B$$

$$v_B = 3 \cdot 3,5 = \left[10,5 \text{ m/s} \right]$$

4)

Dades

$$r = 80 \text{ cm} \cdot \frac{1 \text{ m}}{100 \text{ cm}} = 0,8 \text{ m}$$

$$\theta = \text{voltes} : 2,5$$

$$s = \theta \cdot r$$

$$s = 15,7 \cdot 0,8 = \left[12,56 \text{ m} \right]$$

$$\theta = 2,5 \text{ rev} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} = \left[15,7 \text{ rad} \right]$$

5)

⑤ Dades

$$v = \frac{54 \text{ km}}{\text{h}} \cdot \frac{1000 \text{ m}}{1 \text{ km}} \cdot \frac{1 \text{ h}}{3600 \text{ s}} = 15 \text{ m/s}$$

$$r = 40 \text{ cm} \cdot \frac{1 \text{ m}}{100 \text{ cm}} = 0,4 \text{ m}$$

$$v = w \cdot r$$
$$w = \frac{v}{r} = \frac{15}{0,4} = 37,5 \text{ rad/s}$$

$$\frac{37,5 \text{ rad}}{\text{s}} \cdot \frac{1 \text{ rev}}{2\pi \text{ rad}} \cdot \frac{60 \text{ s}}{1 \text{ min}} = [358,3 \text{ rpm}]$$

⑥

$$w = 30\pi \text{ rad/s}$$

$$t = 15 \text{ min} \cdot \frac{60 \text{ s}}{1 \text{ min}} = 900 \text{ s}$$

$$w = \frac{\theta}{t} \quad ; \quad \text{després passar a rpm}$$

$$900 \text{ s} \cdot \frac{30\pi \text{ rad}}{\text{s}} \cdot \frac{1 \text{ rev}}{2\pi \text{ rad}} = [13500 \text{ rev}]$$