

$$23. \quad \omega = 200 \frac{\text{rev}}{\text{min}} \left| \frac{2\pi \text{ rad}}{1 \text{ rev}} \right| \left| \frac{1 \text{ min}}{60 \text{ s}} \right|$$

$$= 20.9 \text{ rad/s}$$

b)  $v_t = ?$  (rim)

$$v_t = \omega r = (20.9)(0.6 \text{ m}) = 12.6 \text{ m/s}$$

c)  $\alpha = ?$  if  $\omega_f = 1000 \text{ rev/min}$   $t = 1 \text{ min}$

$$\alpha = \frac{\Delta \omega}{\Delta t} = \frac{1000 - 200}{1} = 800 \text{ rev/min}^2$$

d)  $\Delta \theta = ?$

$$\Delta \theta = \frac{1}{2}(\omega_o + \omega_f)t$$

$$= \frac{1}{2}(200 + 1000) 1$$

$$\Delta \theta = 600 \text{ rev}$$

$$22. \theta = 0.30 t^2$$

$$\text{at } t = 5.0 \text{ s } \omega = ? \quad v_t = ? \quad a_t = ?$$

$$a_r = ?$$

$$\omega = ? \quad \omega = \frac{d\theta}{dt} = 0.60 t$$

$$\omega(5) = 0.60(5) = \underline{3 \text{ rad/s}}$$

$$v_t = ? \quad v_t = \omega r = (3)(10) = \underline{30 \text{ m/s}}$$

$$a_t = ? \quad a_t = \alpha r \quad \alpha = \frac{d\omega}{dt} = 0.6$$

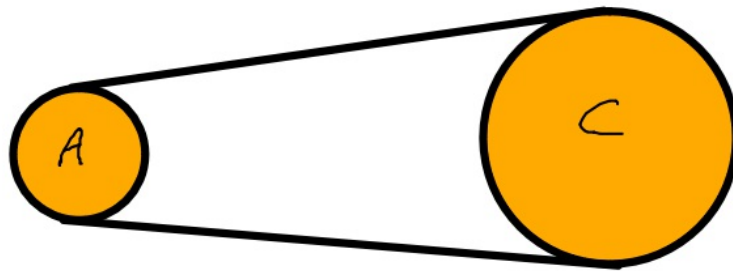
$$a_t = (0.6)(10) = \underline{6 \text{ m/s}^2}$$

$$a_r = \omega^2 r$$

$$= (3^2)(10)$$

$$\underline{a_r = 90 \text{ m/s}^2}$$

28.  
 $t = ?$



$$\alpha_A = 1.6 \text{ rad/s}^2$$

$$\omega_i = 0$$

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$$\omega_f = 10.47 \text{ rad/s}$$

$$V_t = \omega r$$

$$V_{tA} = V_{tC}$$

$$\omega_{fA} r_A = \omega_{fC} r_C$$

$$\omega_{fA} (0.1) = 10.47 (0.25)$$

$$\omega_{fA} = 26.18 \text{ rad/s}$$

$$\omega_f = \omega_i + \alpha t$$

$$26.18 = 0 + 1.6 t$$

$$t = 16.36 \text{ s}$$