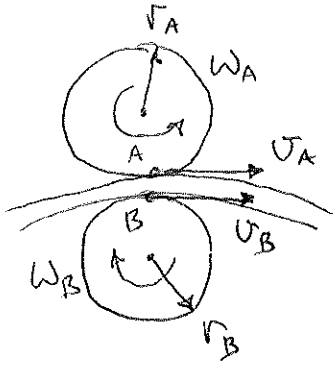


PROB. 15-25



$$r_A = r_B = 24 \text{ mm}, \quad r_{C,i} = 55 \text{ mm}, \quad r_{C,o} = 60 \text{ mm}$$

$$\omega_A = \left(300 \frac{\text{REV}}{\text{MIN}}\right) \left(\frac{2\pi}{\text{REV}}\right) \left(\frac{\text{MIN}}{60 \text{ S}}\right) = 31.41 \frac{\text{RAD}}{\text{S}}$$

a) FIND ω_C AND ω_B

$$v_A = r_A \cdot \omega_A ; \quad v_A = r_{C,o} \cdot \omega_C$$

$$r_A \omega_A = r_{C,o} \omega_C$$

$$\omega_C = \left(\frac{r_A}{r_{C,o}}\right) \omega_A = \left(\frac{24 \text{ mm}}{60 \text{ mm}}\right) \left(31.41 \frac{\text{RAD}}{\text{S}}\right) \left(\frac{\text{REV}}{2\pi \text{ RAD}}\right) \left(\frac{60 \text{ S}}{\text{MIN}}\right)$$

$$\boxed{\omega_C = 120 \text{ RPM}}$$

$$v_B = r_B \cdot \omega_B ; \quad v_B = r_{C,i} \cdot \omega_C$$

$$r_B \omega_B = r_{C,i} \omega_C$$

$$\omega_B = \left(\frac{r_{C,i}}{r_B}\right) \omega_C = \left(\frac{55}{24}\right) (120 \text{ RPM}) = \boxed{275 \text{ RPM}} = 28.8 \frac{\text{RAD}}{\text{S}}$$

b) FIND a_A , a_B

$$a_t = r \alpha = 0 \quad \text{SINCE } \alpha = 0$$

$$a_n = r \omega^2$$

$$a_A = r_A \omega_A^2 = (24 \text{ mm}) \left(31.41 \frac{\text{RAD}}{\text{S}}\right)^2 = \boxed{23,678 \frac{\text{MM}}{\text{S}^2} \uparrow}$$

$$a_B = r_B \omega_B^2 = (24 \text{ mm}) \left(28.8 \frac{\text{RAD}}{\text{S}}\right)^2 = \boxed{19,906 \frac{\text{MM}}{\text{S}^2} \downarrow}$$