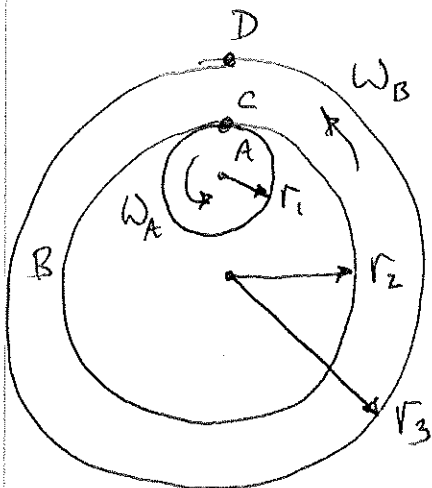


PROB. 15-27



$$\omega_A = 25 \frac{\text{RAD}}{\text{s}}, \quad r_1 = 12 \text{ mm}, \quad r_2 = 30 \text{ mm},$$

$$r_3 = 40 \text{ mm}$$

a) FIND ω_B

$$v = r\omega = r_1 \omega_A = r_2 \omega_B$$

$$\omega_B = \left(\frac{r_1}{r_2} \right) \omega_A = \left(\frac{12}{30} \right) (25) = 10 \frac{\text{RAD}}{\text{s}}$$

b) FIND a_c

W.R.T. SHAFT A:

$$a_t = r\alpha = 0,$$

$$a_n = r\omega^2 = r_1 \omega_A^2 = (12 \text{ mm}) \left(25 \frac{\text{RAD}}{\text{s}} \right)^2 = 7.5 \frac{\text{m}}{\text{s}^2} \downarrow$$

W.R.T. RING B:

$$a_n = r\omega^2 = r_2 \omega_B^2 = (30 \text{ mm}) \left(10 \frac{\text{RAD}}{\text{s}} \right)^2 = 3.0 \frac{\text{m}}{\text{s}^2} \downarrow$$

c) FIND a_D

$$a_n = r\omega^2 = r_3 \omega_B^2 = (40 \text{ mm}) \left(10 \frac{\text{RAD}}{\text{s}} \right)^2 = 4.0 \frac{\text{m}}{\text{s}^2} \downarrow$$