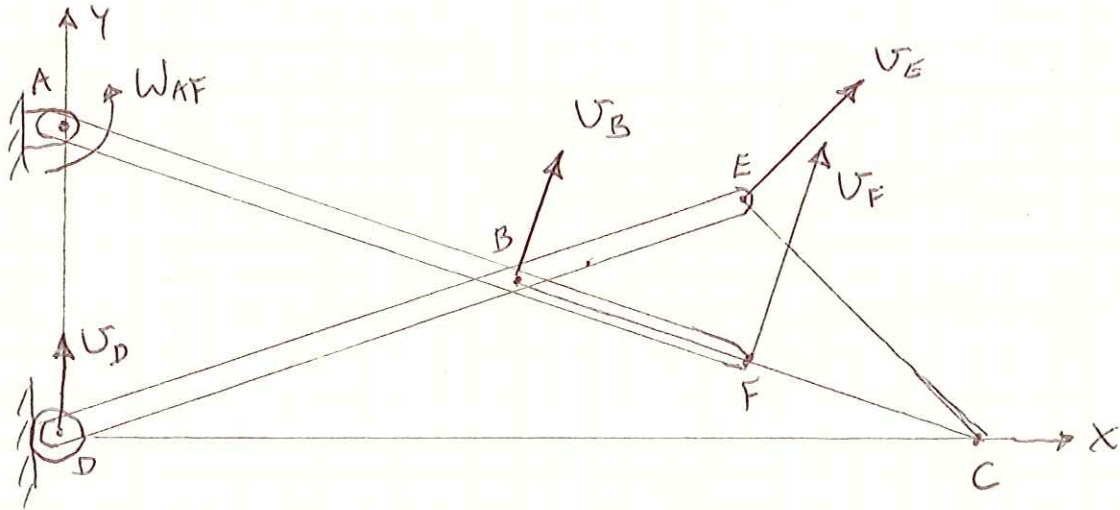


PROB. 15-93



$V_D = 10 \frac{\text{IN}}{\text{s}}$, FIND $\angle V_E = \sqrt{CE} W_{DE}$

$V_D = \sqrt{CD} W_{DE}$, $W_{DE} = \frac{V_D}{\sqrt{CD}}$

FIND C: $X_A = 0$, $Y_A = 2(9 \cdot \sin 15^\circ) = 4.659 \text{ IN}$

$X_B = 9 \cos 15^\circ = 8.693 \text{ IN}$, $Y_B = 9 \sin 15^\circ = 2.329 \text{ IN}$

$Y = mX + b$

$m = \frac{Y_A - Y_B}{X_A - X_B} = \frac{(4.659) - (2.329)}{(0) - (8.693)} = -0.2679$

$Y = -0.2679 X + 4.659$

AT $Y_C = 0$, $X_C = (4.659) / (0.2679) = 17.39 \text{ IN}$

$C(0, 17.39) \text{ IN}$

$W_{DE} = \frac{V_D}{\sqrt{CD}} = \frac{(10 \frac{\text{IN}}{\text{s}})}{(17.39 \text{ IN})} = 0.5750 \frac{\text{RAD}}{\text{s}}$

$E_x = 15 \cdot \cos 15^\circ = 14.49 \text{ IN}$, $E_y = 15 \cdot \sin 15^\circ = 3.882 \text{ IN}$

$\sqrt{CE} = \sqrt{(17.39 - 14.49)^2 + (3.882)^2} = 4.845 \text{ IN}$

$V_E = (4.845 \text{ IN}) \left(0.575 \frac{\text{RAD}}{\text{s}} \right) = \boxed{2.786 \frac{\text{IN}}{\text{s}} \angle 36.76^\circ}$

PROB. 15-93 CONT.

$$\phi = \tan^{-1} \left[\frac{(3.882)}{(17.39 - 14.49)} \right] = 53.24^\circ$$

$$\theta = 90 - 53.24 = 36.76^\circ$$

b) FIND $V_F = V_{AF} \omega_{AF}$

FIRST FIND ω_B :

$$V_B = V_{CB} \cdot \omega_{DE}$$

$$V_{CB} = \sqrt{(17.39 - 8.693)^2 + (2.329)^2} = 9.0 \text{ IN}$$

$$V_B = (9.0 \text{ IN}) \left(0.575 \frac{\text{RAD}}{\text{S}} \right) = 5.175 \frac{\text{IN}}{\text{S}}$$

$$\omega_B = V_{AB} \omega_{AF} \Rightarrow \omega_{AF} = \frac{V_B}{V_{AB}} = \frac{(5.175 \frac{\text{IN}}{\text{S}})}{(9 \text{ IN})} = 0.575 \frac{\text{RAD}}{\text{S}}$$

$$V_F = (15 \text{ IN}) \left(0.575 \frac{\text{RAD}}{\text{S}} \right) = 8.625 \frac{\text{IN}}{\text{S}} \angle 75^\circ$$