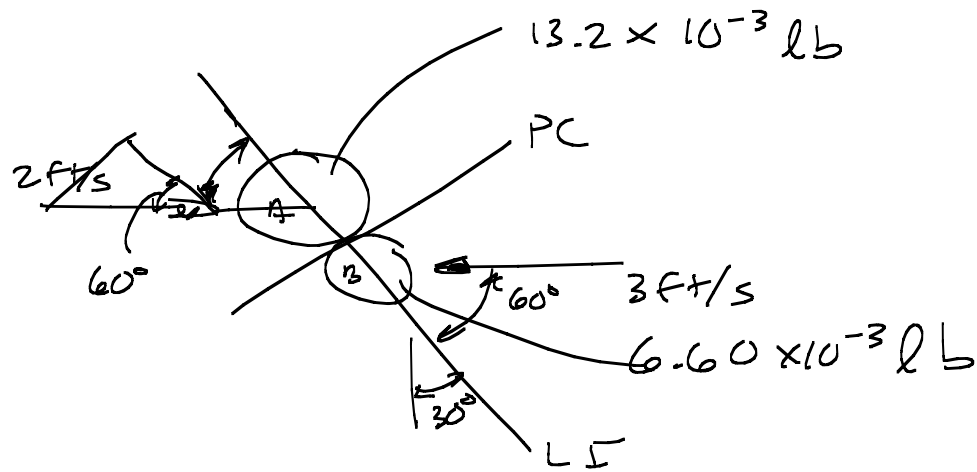


15-83

$e = 0.65$



Conservation of Momentum

$$\frac{(13.2 \times 10^{-3} \text{ lb})}{32.2} (2 \text{ ft/s}) (\cos 60^\circ) - \frac{(6.60 \times 10^{-3})}{32.2} (3 \text{ ft/s}) (\cos 60^\circ)$$

$$= \frac{(13.2 \times 10^{-3} \text{ lb})}{\cancel{32.2}} (V_{A_{LF}})_2 + \frac{(6.60 \times 10^{-3} \text{ lb})}{\cancel{32.2}} (V_{B_{LF}})_2$$

$$0.0132 - 9.9 \times 10^{-3} = 13.2 \times 10^{-3} (V_{A_{LF}})_2 + (6.6 \times 10^{-3}) (V_{B_{LF}})_2$$

$$\boxed{13.2 \times 10^{-3} (V_{A_{LF}})_2 + (6.6 \times 10^{-3}) (V_{B_{LF}})_2 = 0.0033}$$

$$+ \quad e = \frac{(V_{B_{LF}})_2 - (V_{A_{LF}})_2}{(V_{A_{LF}})_1 - (V_{B_{LF}})_1}$$

$$0.65 = \frac{(V_{B_{LF}})_2 - (V_{A_{LF}})_2}{(2 \text{ ft/s})(\cos 60^\circ) - (-3 \text{ ft/s})(\cos 60^\circ)}$$

$$\boxed{(V_{B_{LF}})_2 - (V_{A_{LF}})_2 = 1.625}$$

$$\boxed{(V_{B_{LF}})_2 = 1.25 \text{ ft/s}}$$

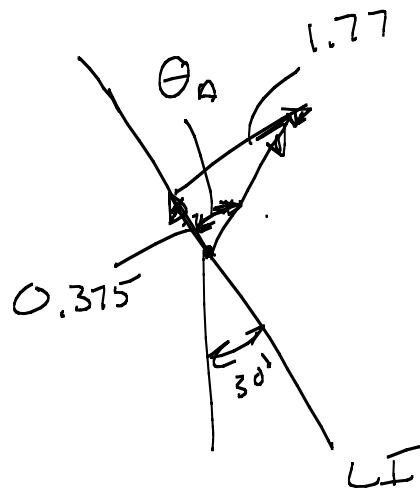
$$\boxed{(V_{A_{LF}})_2 = -0.375 \text{ ft/s}}$$

Plane of Contact

$$\rightarrow (V_{APC})_2 = (V_{APC})_1 = (2 \text{ ft/s})(\sin 60^\circ) = \boxed{1.73 \text{ ft/s}}$$

$$\rightarrow (V_{BPC})_2 = (V_{BPC})_1 = -(3 \text{ ft/s})(\sin 60^\circ) = \boxed{-2.6 \text{ ft/s}}$$

$$(V_A)_2 = \sqrt{(-0.375 \text{ ft/s})^2 + (1.73 \text{ ft/s})^2} = \boxed{1.77 \text{ ft/s}}$$



$$\tan \theta_A = \frac{1.77}{0.375}$$
$$\boxed{\theta_A = 78^\circ}$$

$$(V_B)_2 = \sqrt{(1.25)^2 + (-2.6)^2}$$

$$(V_B)_2 = 2.88 \text{ ft/s}$$

$$\tan \theta_B = \frac{2.6}{1.25}$$

$$\theta_B = 64.3^\circ$$

