

$$36 \quad \frac{A_{\text{slow}}}{A_{\text{fast}}} = ?$$

$$F_D = \frac{1}{2} C_p A v^2$$

$$\frac{2 F_D}{C_p v^2} = A$$

$$\frac{A_{\text{slow}}}{A_{\text{fast}}} = \frac{\cancel{2 F_D}}{\cancel{C_p} v_{\text{slow}}^2} \cdot \frac{\cancel{2 F_D}}{\cancel{C_p} v_{\text{fast}}^2}$$

$$\frac{A_{\text{slow}}}{A_{\text{fast}}} = \frac{v_{\text{fast}}^2}{v_{\text{slow}}^2} = \frac{(310)^2}{(160)^2} = 3.75$$

39. $\frac{F_{D_1}}{F_{D_2}} = ?$ $F_D = \frac{1}{2} C_D A v^2$

$$\frac{\frac{1}{2} C_D (.38) A (277.8)^2}{\frac{1}{2} C_D (0.67) A (138.9)^2} = \frac{29326}{12926} = 2.3$$

37. $v = ?$

$$F_D = f_k$$

$$f_k = \mu_k F_N = (0.8)(196\text{N}) \\ = 156.8\text{N}$$

$$F_D = \frac{1}{2} C \rho A v^2$$

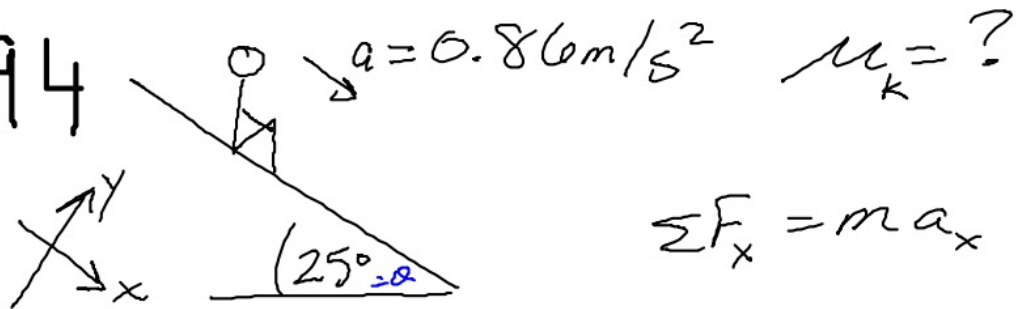
$$v = \sqrt{(2F_D) / (C \rho A)}$$

$$= \sqrt{(2)(156.8) \div ((0.8)(1.2)(0.04))}$$

$$v = 89.95\text{m/s} \approx 324\text{km/h}$$

b) 648km/h

94



$$\Sigma F_x = ma_x$$

$$F_{gx} - f_k = ma_x$$

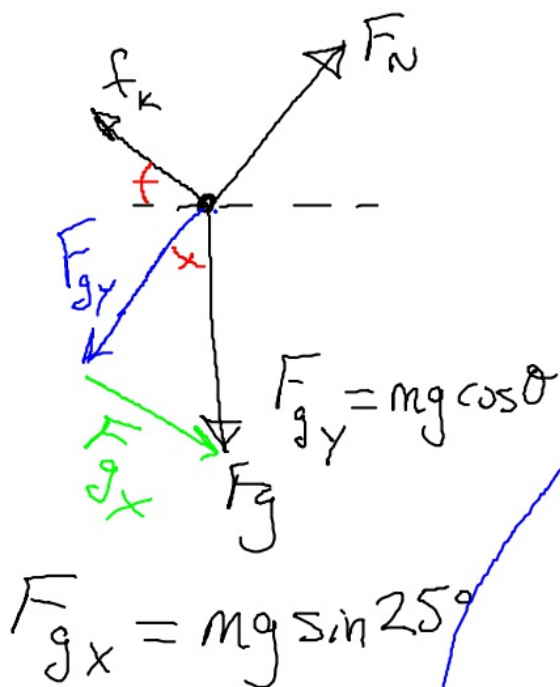
$$mg \sin \theta - \mu_k F_N = ma_x$$

$$mg \sin \theta - \mu_k (mg \cos \theta) = ma_x$$

$$\Sigma F_y = ma_y$$

$$F_N - F_{gy} = ma_y \quad a_y = 0$$

$$F_N = mg \cos \theta$$



$$m(g \sin \theta - \mu_k g \cos \theta) = ma_x$$

$$9.8 \sin 25^\circ - \mu_k 9.8 \cos 25^\circ = .86$$

$$\mu_k = 0.369$$