Sports Car loses road contact at A

a) \( \epsilon = \text{radius of curvature at A} \)

b) \( F \) on driver = 160 lbf
   by the seat of a
driver car = 3100 lbf
   \( \epsilon \) constant \( V = 50 \text{ mph} \)

(c) Car at pt. A.

\[ V = 100 \text{ mi/h} \times \frac{88 \text{ ft/sec}}{60 \text{ mi/h}} = 146.67 \text{ ft/sec} \]

\[ F_x = 0 \quad F_y = 0 \]

\[ N = 0 \quad W = 2400 \text{ lbf} \]

\[ A_x = 0 \quad A_y = \frac{V^2}{\epsilon} \]

\[ F_{f_{\text{m,car}}} = m_{\text{car}} \ddot{a} \]

Tangential: \[ \dot{X} = ma_x \]

Normal: \[ \dot{X} = ma_y = \frac{W[V^2]}{q} \]

\[ 2400 \text{ lbf} = \frac{2400 \text{ lbf}}{32.2 \text{ ft/sec}^2} \left( \frac{(146.67 \text{ ft/sec})^2}{\epsilon} \right) \]

\[ \epsilon = \frac{(146.67 \text{ ft/sec})^2}{32.2 \left( \frac{668.077}{32.2} \right)^2} = 668.077 \]

\[ \epsilon = 668 \text{ ft} \]

(b) \( a_x = 0 \)

\[ V = 50 \text{ mi/h} [88 \frac{3}{5} \text{ ft/sec}] = 73.33 \text{ ft/sec} \]

\[ X = ma_x \]

Normal: \[ F_{f_{\text{man}}} = m_{\text{man}} a_y = \frac{W V^2}{q} \]

\[ 160 \text{ lbf} - N = \frac{160 \text{ lbf}}{32.2 \left( \frac{668}{32.2} \right)^2} \]

\[ \text{Force on man} = N = 120 \text{ lbf} \]

Check your algebra!