1) Massa:

$$1,0 X 10^3 kg$$

Raio da curva:20m

Velocidade escalar: 36Km/hr = 10m/s

Força resultante : 5000N

$$F_{CP} = M \cdot \frac{V^2}{R}$$

$$F_r = 1000 \cdot \frac{100}{20}$$
$$F_r = 1000 \cdot 5$$
$$F_r = 5000N$$

2)

Força centrípeta:

$$F_{CP} = M \cdot \frac{(V_f = V_0 + AT)^2}{R}$$

$$F_{CP} = 3 \cdot \frac{(V_f = 0 + 4 \cdot 1)^2}{R}$$

$$F_{CP} = 3 \cdot \frac{16}{3}$$

$$F_{CP} = 16N \;\; Simplificando$$

Força tangencial:

$$F_T = A \cdot M$$
$$F_T + 4 \cdot 3$$
$$F_T = 12N$$

Força resultante:

$$F_R = F_C + F_T$$
$$F_R = 16 + 12$$
$$F_R = 28N$$

3)

Relações trigonométricas

$$Sen30° = \frac{F_{ctp}}{\vec{F}}$$

$$\frac{1}{2} = \frac{\frac{M \cdot V^2}{R}}{32}$$

$$16 = \frac{3 \cdot 4^2}{R}$$

$$16R = 48$$

$$R = \frac{48}{16}$$

$$R = 3m$$

4)

a)

Força Centrípeta:

$$F_{CP} = M \cdot \frac{(V_f = V_0 + AT)^2}{R}$$
$$F_{CP} = 750 \cdot \frac{50^2}{60}$$
$$F_{CP} = 750 \cdot 41,666...$$
$$F_{CP} = 31.250N$$

B)

Não sei fazer

C)

$$F_{CT} = F_{atc}$$
$$F_{CT} = 0,9 \cdot 750 \cdot 10$$
$$F_{CT} = 6.750$$
$$\frac{MV^2}{R} = 6.750$$
$$\frac{750V^2}{60} = 6.750$$
$$V^2 = \frac{6.750 \cdot 60}{750}$$
$$V^2 = 540$$
$$V = \sqrt{540}$$
$$V \approx 23,23m/s \quad Ou \quad 83,6Km/h$$

D)

$$F_{CT} = F_{atc}$$
$$\frac{MV^2}{R} = 0,1 \cdot 750 \cdot 10$$
$$\frac{750V^2}{60} = 750$$
$$V^2 = \frac{750 \cdot 60}{750}$$
$$V^2 = 60$$
$$V = \sqrt{60}$$
$$V \approx 7,75m/s \quad Ou \quad 27,89Km/h$$

5)

A)

Força Centrípeta:

$$F_{ctp} = \frac{(MV^2)}{R}$$
$$F_{ctp} = \frac{150 \cdot 12,5^2}{10}$$
$$F_{ctp} = \frac{23.437,5}{10}$$
$$F_{ctp} = 2.343,75N$$

B)

Ponto A:

$$F_{ctp} = F_n - p$$
$$2.343,75 = F_n - p$$
$$2.343,75 = F_n - 1500$$
$$2.343,75 + 1500 = F_n$$
$$F_n = 3.843,75N$$

Ponto B:

$$F_{ctp} = F_n$$
$$F_n = 2.343,75N$$

Ponto C:

$$F_{ctp} = F_n + p$$
$$2.343,75 = F_n + p$$
$$2.343,75 = F_n + 1500$$
$$2.343,75 - 1500 = F_n$$
$$F_n = 843,75N$$

C)

A força normal tem que ser maior que 0 no ponto C

$$F_{ctp} = F_n + p$$
$$\frac{(MV^2)}{R} = F_n + p$$
$$\frac{(150V^2)}{10} = F_n + 1500$$
$$\frac{(15V^2)}{1} = F_n + 1500$$
$$15V^2 = F_n + 1500$$
$$F_n = 15V^2 - 1500$$
$$15V^2 - 1500 > 0$$
$$15V^2 > 1500$$
$$V^2 > \frac{1500}{15}$$
$$V^2 > 100$$
$$V > \sqrt{100}$$
$$V > 10$$