Question 1:

A commercial jetliner is traveling a constant 250 m/s when it executes an emergency 180 degree turn. If the turn takes 20 seconds, what is the acceleration experienced by the passengers? What is the radius of the curve taken by the plane?

1)

$$a_t = \dot{V} = 0 \qquad\qquad a_n = V\dot{\theta} = \frac{V^2}{\rho}$$

$$\left(250\, m/s\right)\left(\frac{\pi\ rad}{20\ s}\right) = \frac{\left(250\, \frac{m}{s}\right)^2}{\rho}$$

$$\boxed{\rho = 1592\ m \quad = 1.59\ hm}$$

2)

$$a = a_n = \left(250\, \frac{m}{s}\right)\left(\frac{\pi}{20}\ rad/s\right) = \boxed{39.3\ m/s^2 \approx 4\ g's\ !}$$