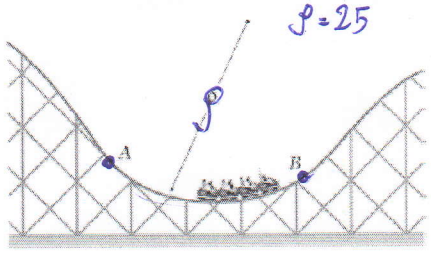
$a_n = 3g \quad \frac{d\rho}{dt} = 0$

$= 3 \times 9.81$



PROBLEM 11.134

Determine the maximum speed that the cars of the roller-coaster can reach along the circular portion AB of the track if ρ is 25 m and the normal component of their acceleration cannot exceed 3 g.

Answer $(v_{max})_{AB} = 97.6$ km/h

$a_n = \frac{v^2}{\rho}$; $v = ?$

$\rho = 25$

$a_n = 3 \times 9.81 = 29.43$

$29.43 = \frac{v^2}{25}$

$v = 27.12 \ m/s$

$v = 27.12 \frac{m}{s} \times \frac{1 \ km}{1000 \ m} \times \frac{3600 \ s}{1 \ hr}$

$v = 97.632 \ \frac{km}{hr}$ ✻