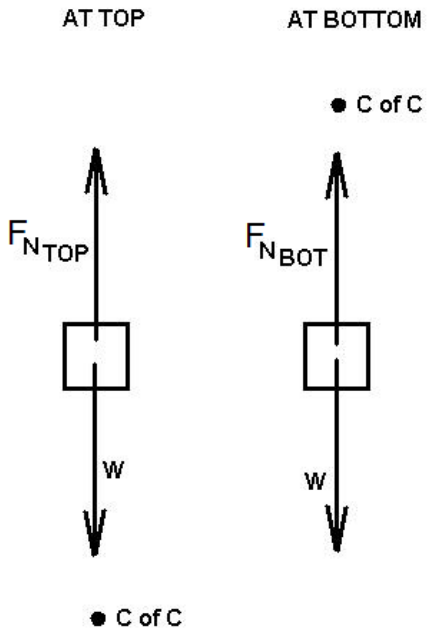
5-2)



a)
r = d/2 = 100/2 = 50m
ω = 1 rev/60s = $2\pi/60$ = 0.105 rad/sec
$v_T = r\,\omega = 50*2\pi/60 =$ 5.23 m/s

b)

W = 880N so m = W/g = 88 kg

Use NII

At the top, downward is toward the center of the circle:

$+W - F_{N\,TOP} = ma_C = mv_T^2/r$

$F_{N\,TOP} = W - mv_T^2/r = 880 - 88*5.23^2/50 =$ 832N
This is the person's 'apparent weight.'

c)

At the bottom, upward is toward the center of the circle:
$F_{N\,BOT} - W = mv_T^2/r$
$F_{N\,BOT} = W + mv_T^2/r = 882 + 88*5.23^2/50 =$ 928N
Again, the 'apparent weight.'

d)
Find the speed such that $F_{N'\,TOP} \rightarrow 0$.
$+W = mv_T^2/r$
$v_T = [Wr/m]^{1/2} = [gr]^{1/2} = [10*50]^{1/2} =$ 22.4 m/s

Since the circumference is $\pi d = 100\pi = 314.2$ m, the time to complete one revolution would be
$t = s/v_T = 314.1/22.4 =$ 14.0 seconds