P #27 Ch 7 - pg 216

2) $d = 18.0\ m$

$r = \frac{18.0\ m}{2} = 9.0\ m$

rate = 4 revolutions per minute

$V_t = \frac{d}{t} = \frac{4 \cdot (2\pi r)}{60\ sec}$

$= \frac{4 \cdot 2 \cdot \pi (9.0\ m)}{60\ sec}$

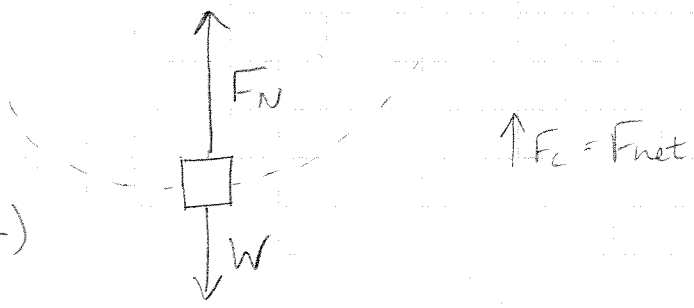
$V_t = 3.77\ m/s$

$a_c = \frac{V_t^2}{r} = \frac{(3.77\ m/s)^2}{(9.0\ m)}$

$\boxed{a_c = 1.58\ m/s^2}$

b) $m = 40\ kg$

Fc is directed up (towards circle center)



$F_c = F_{net} = F_N - W$

$F_c = m \cdot a_c = (40\ kg)(1.58\ m/s^2)$

$F_c = 63.2\ N$

$W = m \cdot g = (40\ kg)(9.8\ m/s^2)$

$W = 392\ N$

$F_c = F_N - W$

$63.2\ N = F_N - 392\ N$

$\boxed{F_N = 455\ N}$