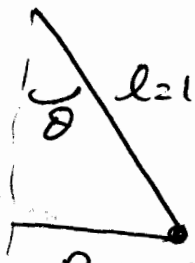
PROB

A. 

$T_x = T\sin\theta$

$T_y = T\cos\theta$



$\theta = \sin^{-1}\left(\frac{R}{l}\right)$

$= \sin^{-1}\left(\frac{.56}{1.86}\right)$

$\theta = 17.5°$

$W = mg = 19.6\,N$

FROM NEWTON'S 2nd LAW

$T\sin\theta = \frac{mv^2}{R}$ and $T\cos\theta = mg$

$T = \frac{mg}{\cos\theta} = \frac{19.6N}{\cos 17.5°} = \boxed{20.6N}$

B. $F_c = \frac{mv^2}{R} = T\sin\theta$

$F_c = (20.6N)(\sin 17.5°) = \boxed{6.18N}$

$\vec{F}_c$ IS DIRECTED TOWARD CENTER OF CIRCLE

THE SOURCE OF $\vec{F}_c$ IS THE COMPONENT OF $\vec{T}$ IN THE PLANE OF THE CIRCLE.

C. FROM $\frac{mv^2}{R} = T\sin\theta$

$v = \sqrt{\frac{RT\sin\theta}{m}} = \sqrt{\frac{(.56m)(6.18N)}{2.00kg}}$

$\boxed{v = 1.32\,m/s}$

D FROM $v = \frac{2\pi R}{T}$ $\quad T = \frac{2\pi R}{v}$

$T = \frac{(2\pi)(.56m)}{1.32\,m/s}$

$\boxed{T = 2.67s}$