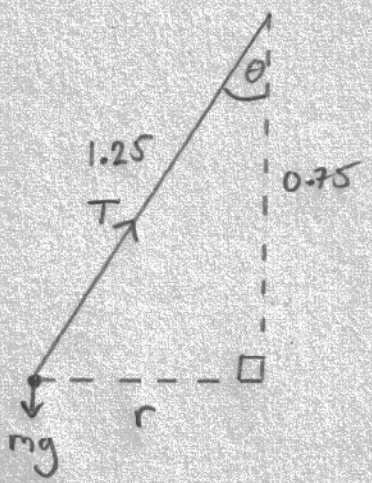
1a



$\cos\theta = \frac{0.75}{1.25} = \frac{75}{125} = \frac{3}{5}$

$\sin\theta = \frac{4}{5}$ (3.4.5 rt'd Δ)

$(v = 1)$

Resolving Vertically $T\cos\theta = mg$

$T \cdot \frac{3}{5} = mg$

$T = \frac{5mg}{3}$

Resolving horizontally for Circular motion

$T\sin\theta = mr\omega^2$

$\frac{5mg}{3} \cdot \frac{4}{5} = m(1)(\omega^2)$

$\frac{4g}{5} = \omega^2$

$\omega = \sqrt{\frac{4g}{5}} = \sqrt{\frac{4\times 9.8}{5}} = 1.62 \text{ rads}^{-1}$

1b