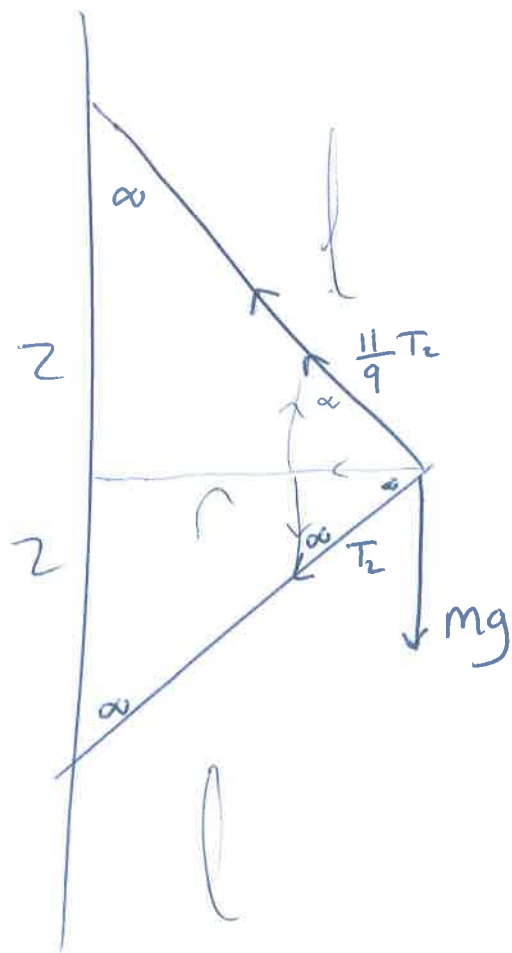


2011
6(b)



$$\frac{T_1}{T_2} = \frac{11}{9}$$

$$T_1 = \frac{11}{9} T_2$$

$$\uparrow \downarrow \quad \therefore T_2 \frac{11}{9} \cos \alpha = mg + T_2 \cos \alpha$$

$$\frac{11}{9} T_2 \cos \alpha - \frac{9 T_2}{9} \cos \alpha = mg$$

$$\boxed{\frac{2 T_2}{9} \cos \alpha = mg} \quad (1)$$

$$\rightarrow \leftarrow \quad \therefore \frac{11}{9} T_2 \sin \alpha + T_2 \sin \alpha = m r \omega^2$$

$$\boxed{\frac{20 T_2}{9} \sin \alpha = m r \omega^2} \quad (2)$$

② ÷ ① :

$$\frac{\frac{20T_2}{9} \sin \alpha}{\frac{2T_2}{9} \cos \alpha} = \frac{\cancel{m}r\omega^2}{\cancel{m}g}$$

$$10 \tan \alpha = \frac{r\omega^2}{g}$$

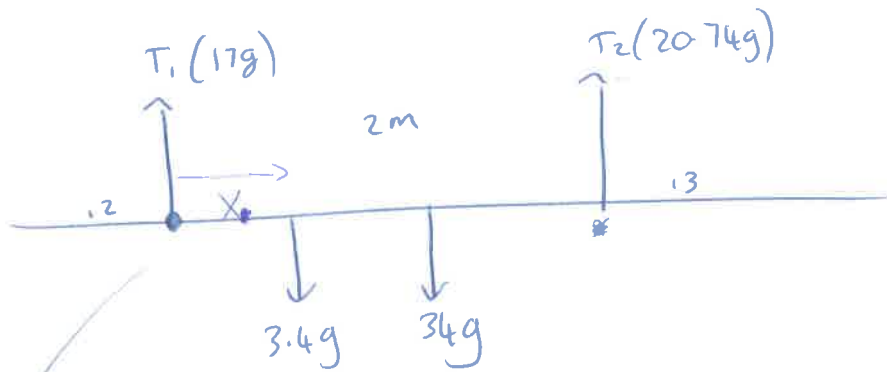
$$10 \cdot \frac{\cancel{r}}{2} = \frac{r\omega^2}{g}$$

$$5g = \omega^2$$

$$\omega = \sqrt{5g} = 7$$

200 g

7a



↳ $3.4g(x) + 34g(\overset{0.8}{1.3}) = 20.74g(1.5)$

$$3.4x + 44.12 = 31.11$$

$$x_1 = 1.15m$$

↳* $17g(1.5) = 3.4g(1.5-x) + 34g(0.2)$

$$x = 1m$$

$$ab = 0.15m$$

or
15cm

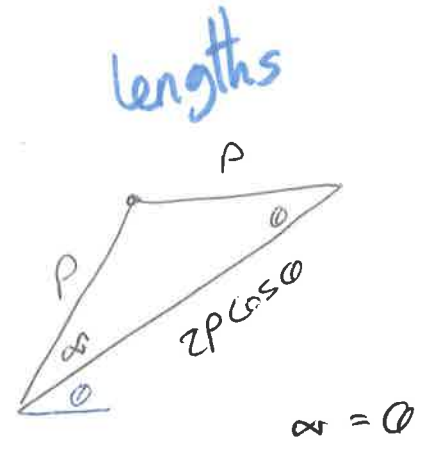
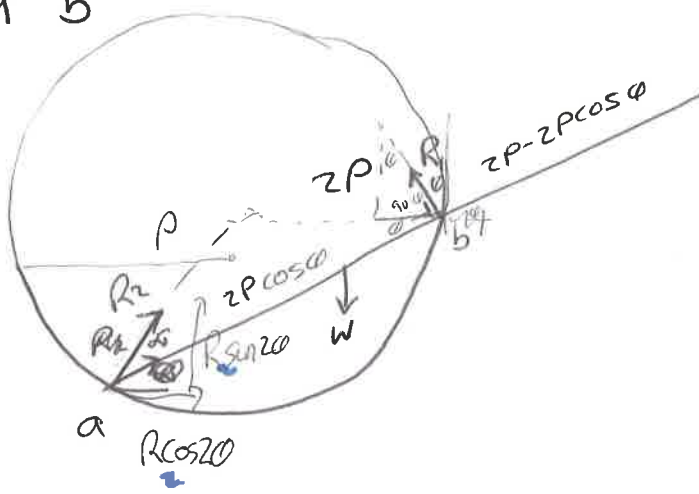
or $x_1 = 1.15$

$$x_2 = 0.5$$

$$\text{Ans } ab = 0.15$$



2009 b



i) Ga : $R_1(zP \cos \phi) = W \left(P \cos \phi \right)$

$R_1 = \frac{W}{2}$

ii) $\alpha = 0$ (see Δ above)

\leftrightarrow : $R_2 \cos 2\phi = R_1 \sin \phi$ $R_2 \cos 2\phi = \frac{W \sin \phi}{2}$

$\uparrow \downarrow$: $R_2 \sin 2\phi + R_1 \cos \phi = W$

$R_2 = R_2$: $\frac{R_1 \sin \phi}{\cos 2\phi} = \frac{W - R_1 \cos \phi}{\sin 2\phi}$

$R_1 \sin \phi \sin 2\phi = W \cos 2\phi - R_1 \cos \phi \cos 2\phi$

$R_1 (\cos \phi \cos 2\phi + \sin \phi \sin 2\phi) = W \cos 2\phi$

$R_1 (\cos \phi) = W \cos 2\phi$

$\frac{W}{2} \cos \phi = W \cos 2\phi$

$\cos \phi = 2 \cos 2\phi$