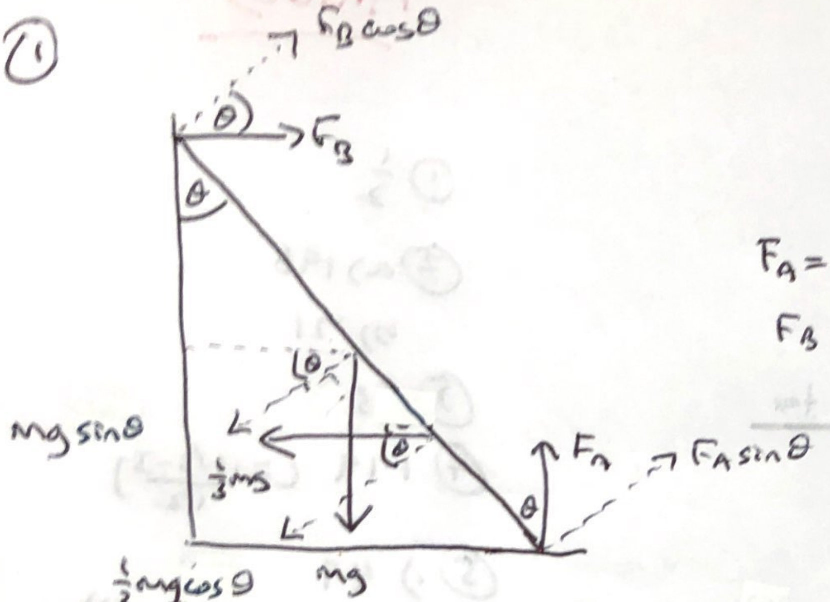
1



$F_A = mg$

$F_B = \frac{1}{3} mg$

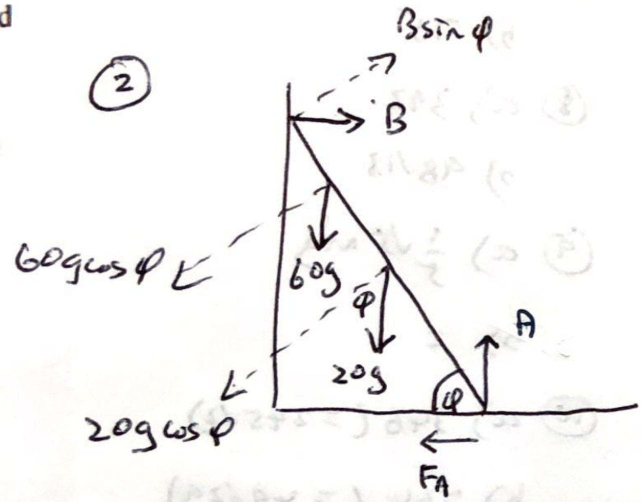
$M(A) \quad \frac{1}{3} mg\cos\theta \left(\frac{1}{2}a\right) + mg\sin\theta\,(a) = \frac{1}{3} mg\cos\theta\,(2a)$

~~[illegible]~~

$\frac{1}{6} + \tan\theta = \frac{2}{3}$

$\tan\theta = \frac{1}{2}$

2



$\mu = \frac{1}{4}$

$\updownarrow$ $A = 80g$

"$F = \mu R$" $\Rightarrow F_A = \frac{1}{4}A$

$= 20g = 196$

$\leftrightarrow$ $B = 196$

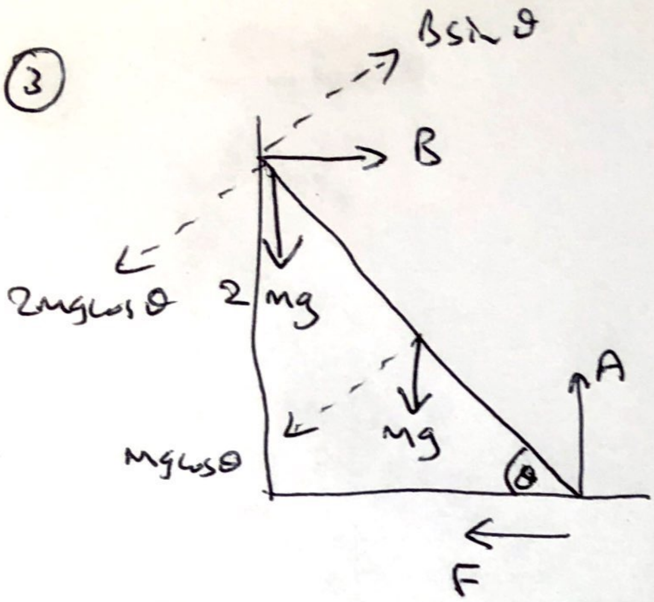
$M(A)$ $20g\cos\varphi(2.5) + 60g\cos\varphi(4)$

$= 20g\sin\varphi(5)$

$\therefore \tan\varphi = \dfrac{50 + 240}{100}$

$\varphi = 71°$

(3)



$\leftrightarrow$ $B = F$

$\updownarrow$ $A = 3mg$

"$F = \mu R$" $F = \frac{5}{12} \times 3mg = \frac{5mg}{4}$

$M(A)$ $mg\cos\theta\,(a) + 2mg\cos\theta\,(2a)$

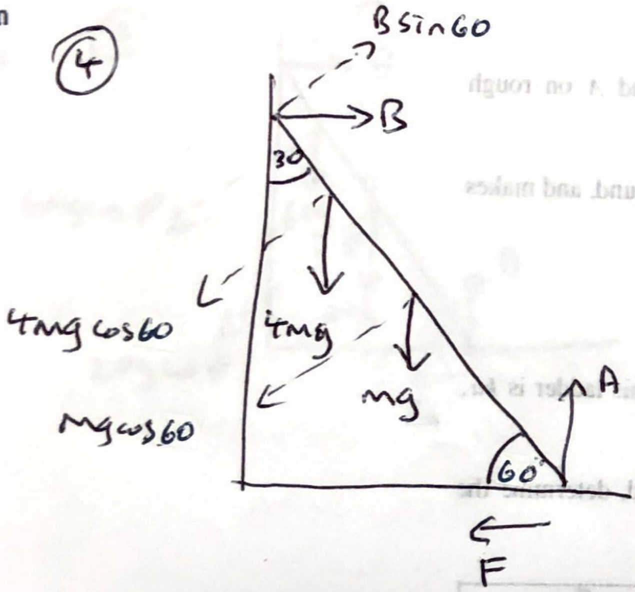
$= B\sin\theta\,(2a)$

$1 + 4 = \frac{5}{\cancel{4}\,2}\tan\theta$

$\tan\theta = 2$

$\theta = 63.4^\circ$

4



$B = F$

$A = 5mg$

$F = \mu R \quad F = \frac{1}{3} A = \frac{5}{3} mg$

$M(A) \quad mg\cos 60 (a) + 4mg\cos 60 (ka)$

$= \frac{5}{3} mg \sin 60 (2a)$

$\therefore 1 + 4k = \frac{10}{3}\sqrt{3}$

$k = \dfrac{\frac{10\sqrt{3}}{3} - 1}{4}$

$= \dfrac{10\sqrt{3} - 3}{12}$