Taking moments about B.

$\sqrt{4\ell^2 - x^2}\,\mu R + Wx = Rx$

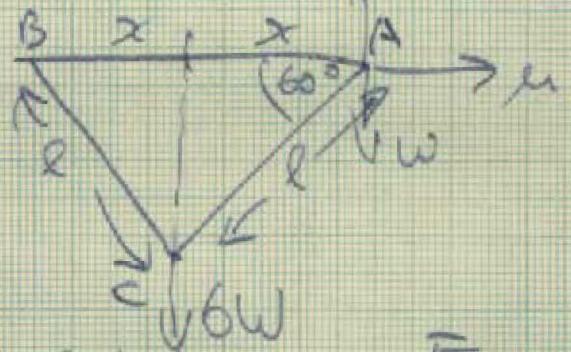
$\frac{3}{4}\left(\sqrt{4\ell^2 - x^2}\right)\mu + Wx = 3Wx$

$\left(9\ell^2 - 9x^2\right)\mu^2 = 4x^2$

$9\ell^2\mu^2 - 9x^2\mu^2 = 4x^2$

$9\ell^2\mu^2 = \left(4 + 9\mu^2\right)x^2$

$\therefore x = \dfrac{3\mu\ell}{\sqrt{4 + 9\mu^2}}$



If the rings just start to slide $F = \mu R$

$\therefore$ moments about C

$xW + \cancel{\quad} + x\cos 60°\left(\mu R\right) = Rx$

Taking moments about B

$6Wx + 2Wx = 2xR$

$\therefore R = 4W.$

$\therefore$ in ① $W + \frac{x}{2}\left(4W\mu\right) = 4Wx$

$\therefore 1 + 2\mu x = 4x$

P.T.O.

$\therefore 2\mu x = 4x - 1$

$\therefore \mu = \frac{4x-1}{2x} = 2 - \frac{1}{2x}$

$= 2 - \frac{\sqrt{4+8\mu^2}}{6\mu}$

$\therefore$ coeff of friction $= 2 - \frac{1}{2x}$

---

x_1	$\tan\theta$
60·09	1·6030
68·68	1·6873
	3·2903
56·22	1·7103
	1·5800