

## Answer key 2

$$N_1 + F_2 - Mg = 0$$

$$F_1 - N_2 = 0$$

$$F_1 = \mu N_1 \text{ and } F_2 = \mu N_2$$

$$F_1 = \frac{\mu Mg}{1+\mu^2} \text{ and } F_2 = \frac{\mu^2 Mg}{1+\mu^2}$$

$$I = \frac{MR^2}{2}; \quad \tau = I\alpha$$

$$-F_1 R - F_2 R = \frac{MR^2}{2} \alpha$$

$$\alpha = -\frac{\mu}{1+\mu^2} \cdot \frac{2g}{R} (1+\mu)$$

$$\omega(t) = \omega_0 + \alpha t \Rightarrow T_{stop}$$

$$\theta(t) = \omega(t) t \Rightarrow N = \frac{\theta_{stop}}{2\pi}$$

