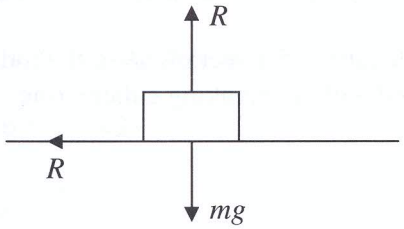
6 **(b)** A table moves in a horizontal plane with simple harmonic motion. The table completes N oscillations per minute.

Find, in terms of μ and N, the greatest allowable amplitude of the motion if an object placed on the table is not to s lip, where μ is the coefficient of friction.



$$\text{frequency} = \frac{N}{60}$$

$$\frac{\omega}{2\pi} = \frac{N}{60}$$

$$\omega = \frac{\pi N}{30}$$

$$F = mr\omega^2$$

$$\mu R = mr\omega^2$$

$$\mu mg = mr\omega^2$$

$$\mu g = r\left(\frac{\pi N}{30}\right)^2$$

$$r = \frac{900\mu g}{\pi^2 N^2} \quad \text{or} \quad \frac{893.65\mu}{N^2}$$

5

5

5

5

5

25