

$$X: \sum F = ma$$

$$F_N \sin \theta = m \frac{v^2}{r}$$

$$y: F_N \cos\theta = F_g \text{ * horizontal circle}$$

\therefore sub y into x

$$V^2 = r g \tan \theta$$

$$2. \quad \sum F = m_{\text{Mars}} \cdot a$$

$$F_g = M_{\text{Mars}} \cdot \frac{V^2}{r}$$

$$V = \frac{2\pi r}{T}$$

$$\therefore T = \frac{2\pi r}{v}$$

$$\frac{F_g \cdot r}{m} = 3V^2 \quad T(s) = \underline{\hspace{2cm}} \text{ (years)}$$

$$\text{Mars} = (\Theta_{IR, \text{fit}} \Theta_{200}) \text{ at}$$

$$T(s) = \underline{\hspace{2cm}} \text{ (years)}$$

30

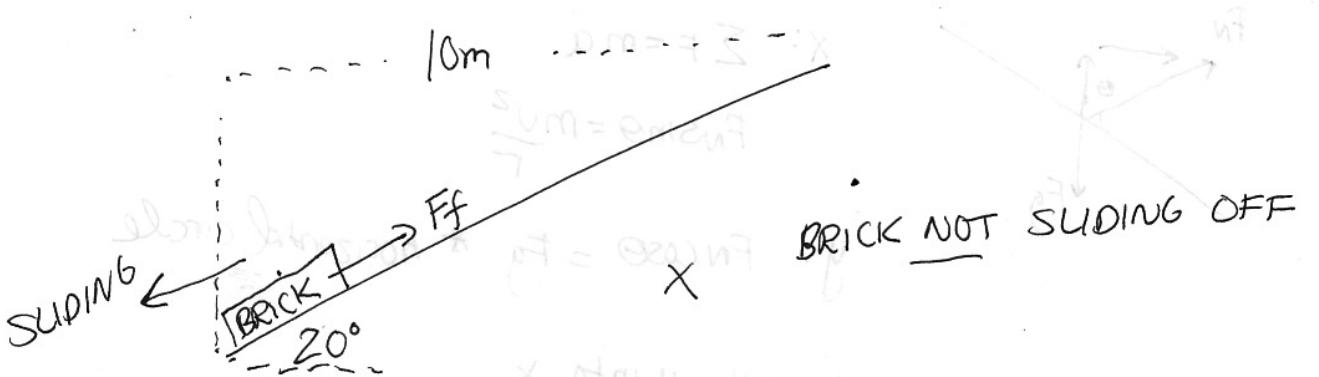
$$\sum F = ma$$

$$F_{\text{arm}} = m_{\text{female}} \cdot \frac{v^2}{r} ; v = \frac{2\pi r}{T} = 2\pi r f \quad (\text{and pm})$$

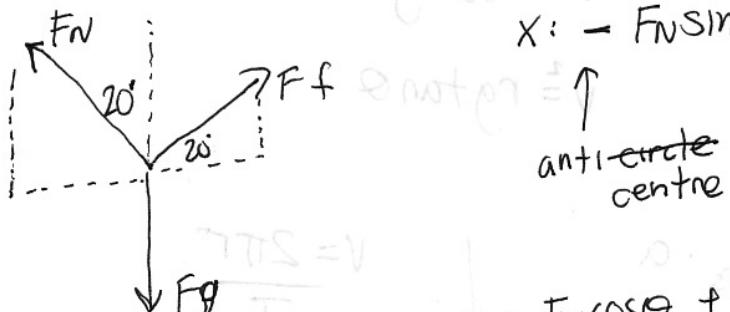
$$\therefore \text{Farms} = m_{\text{female}} \cdot 4\pi^2 r_f^2$$

$$\vec{\text{Farms of female}} = -\vec{\text{Farms of male}}$$

4.



$$x: -F_N \sin\theta + F_f \cos\theta = \frac{mv^2}{r}$$



towards center of rotation.

$$y: F_n \cos \theta + F_f \sin \theta - F_g = 0$$

NOT SLIDING

$$q: F_n \cos\theta + \mu F_n \sin\theta = mg$$

$$F_N (\cos\theta + \mu \sin\theta) = mg$$

$$F_N = \underline{m g}$$

$$\cos\theta + \mu \sin\theta$$

$$x: \frac{-(mg)(\sin\theta)}{\cos\theta + \mu\sin\theta} + \frac{(\kappa)(mg)(\cos\theta)}{\cos\theta + \mu\sin\theta} = m \frac{v^2}{r} \quad \boxed{v = 2\pi r f}$$

$$\therefore \frac{-g \sin \theta}{\cos \theta + \mu \sin \theta} + \frac{\mu g \cos \theta}{\cos \theta + \mu \sin \theta} = 2\pi^2 r f^2$$

sq root

cancel f, cancel

$$= f \text{ (Hz)}$$

$$= f \text{ (r.p.minute)}$$