

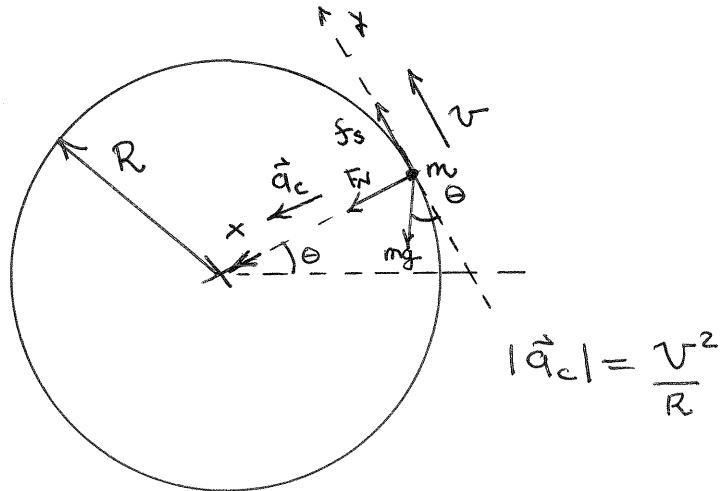
CH5 #42

Rev / s TO FALL OFF at

Angle θ_0 (SPECIFIC ANGLE)

$$T = \frac{2\pi R}{v} \quad f = \frac{1}{T} = \frac{v}{2\pi R} \quad \leftarrow \text{find}$$

$$f \equiv \# \text{ REV/S}$$



NEWTON'S SECOND LAW IN THE

x (RADIAL, TOWARD CENTER) DIRECTION \Rightarrow

$$\sum F_x = +F_N + mg \sin \theta = m a_c = \frac{mv^2}{R}$$

AT Angle θ_0 m falls off \Rightarrow Loses CONTACT WITH DRUM

$$\Rightarrow \underline{F_N = 0} \Rightarrow$$

\nearrow O Lose Contact

$$F_N + mg \sin \theta_0 = \frac{mv_{\text{fall}}^2}{R}$$

$$g \sin \theta_0 = \frac{v_{\text{fall}}^2}{R}$$

$$v_{\text{fall}} = \sqrt{gR \sin \theta_0}$$

$$f = \frac{v_{\text{fall}}}{2\pi R}$$

$$f = \frac{\sqrt{gR \sin \theta_0}}{2\pi R} \quad \text{Rev/s}$$