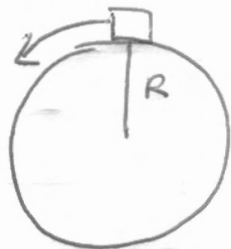


3-23 In a test of a “g-suit,” a volunteer is rotated in a horizontal circle of radius 7.0 m. What is the period of rotation at which the centripetal acceleration has a magnitude of a) $3.0g$? b) $10g$?

Circular motion - example (g suit)

3-23

(a)



$$R = 7.0 \text{ m}$$

$$\text{want } a_{\text{RAD}} = 3g = \frac{v^2}{R}$$

$$29.4 \text{ m/s}^2$$

$$v = \sqrt{a_{\text{RAD}} R} = \sqrt{3gR}$$

$$v = 14.3 \text{ m/s}$$

$$T = \frac{2\pi R}{v} = 3.07 \text{ s}$$

$$f = \text{frequency} = \frac{\text{revs}}{\text{second}} = \frac{1}{T} = 0.326 \frac{\text{rev}}{\text{s}} = 0.326 \text{ Hz}$$

(b) If $a_{\text{RAD}} = 10g$ $v = 26.2 \text{ m/s}$
 $T = 1.68 \text{ s}$