

Moment of inertia of the ball about the axis of rotation

$$I = mR^2 = 3.6 \times 0.31^2 = 0.3460 \text{ kg.m}^2$$

$$\alpha = \frac{a}{R} = \frac{7}{0.31} = 22.58 \text{ rad/s}^2$$

$$(a) \quad \tau = I\alpha = mR^2 \cdot \frac{a}{R} = mRa = 0.3460 \times 22.58 = 7.81 \text{ N.m}$$

$$(b) \quad \tau = F \cdot R_{\perp}$$

$$F = \frac{\tau}{R_{\perp}} = \frac{7.81}{0.025} = 312.47 \text{ N}$$