



$$\sum F_x = 0: P \cos 15^\circ + F - mg \sin 15^\circ = 0 \quad (1)$$

$$\sum F_y = 0: P \sin 15^\circ - mg \cos 15^\circ + N = 0 \quad (2)$$

$$\sum M_G = 0: Fr - P\left(\frac{r}{2}\right) = 0 \quad (3)$$

$$\text{Also, for impending slip: } F = \mu_s N \quad (4)$$

Algebraically solve Eqs. (1)-(4) to obtain

$$\underline{\mu_s = 0.0959}, \quad \underline{N = 0.920mg}, \quad \underline{F = 0.0883mg}, \quad \underline{P = 0.1766mg}$$

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