

Chapter 4 Review - Forces

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A 95 kg clock initially at rest on a horizontal floor requires a 650 N horizontal force to set it in motion. After the clock is in motion, a horizontal force of 560 N is required to keep it moving with a constant speed. Find μ_s and μ_k .

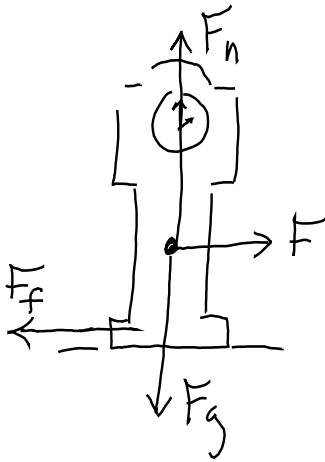
$$m = 95 \text{ kg}$$

$$F_s = 650 \text{ N}$$

$$F_k = 560 \text{ N}$$

$$\frac{F_f}{F_n} = \frac{\mu F_n}{F_n}$$

$$\mu = \frac{F_f}{F_n}$$



$$F_n = F_g = mg$$

$$\mu = \frac{F_f}{mg}$$

$$\mu_s = \frac{F_s}{mg} = \frac{650 \text{ N}}{(95 \text{ kg})(9.81 \frac{\text{m}}{\text{s}^2})} = \boxed{0.70 = \mu_s}$$

$$\mu_k = \frac{F_k}{mg} = \frac{560 \text{ N}}{(95 \text{ kg})(9.81 \frac{\text{m}}{\text{s}^2})} = \boxed{0.60 = \mu_k}$$

$$\frac{\text{N}}{\text{kg} \cdot \frac{\text{m}}{\text{s}^2}} = \frac{\text{N}}{\text{N}} = \text{unitless}$$