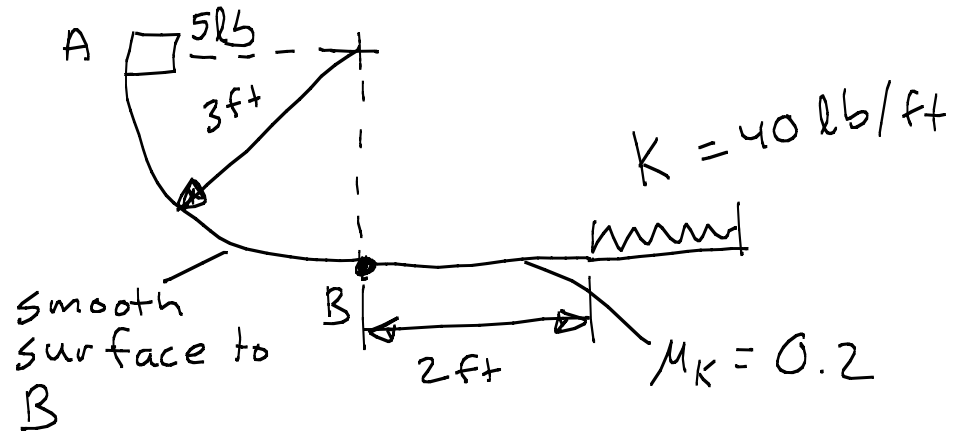


Problem 2

Determine: How far the spring compresses before the block stops

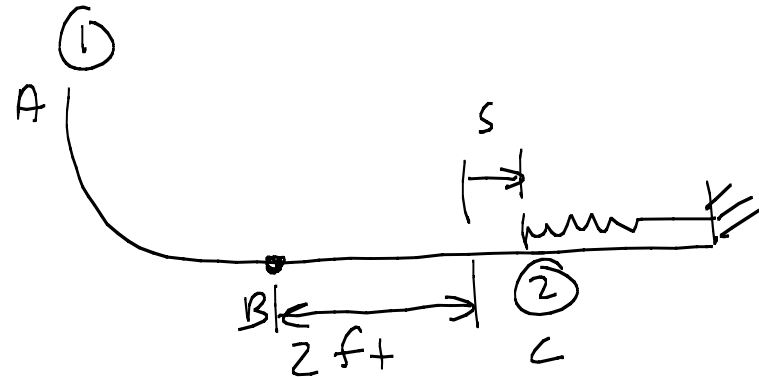


Principle of work and Energy ①

$$T_1 + \sum U_{1-2} = T_2$$

$$T_1 = 0$$

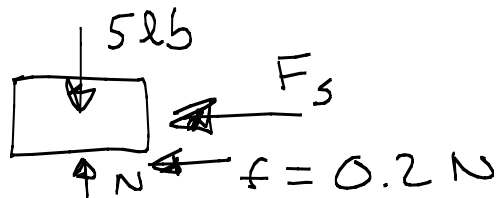
$$\sum U_{1-2} = \sum U_{AB} + \sum U_{BC}$$



AB

$$U_{AB} = (5 \text{ lb})(3 \text{ ft}) = 15 \text{ lb} \cdot \text{ft}$$

BC



$$\sum F_y \Rightarrow N = 5 \text{ lb} \quad f = (0.2)(5 \text{ lb}) = 1 \text{ lb}$$

$$\sum U_{Bc} = -\frac{1}{2}(40 \text{ lb/ft})s^2 - (1 \text{ lb})(2f + s)$$

$$T_2 = 0$$

$$0 - 20s^2 - (2 + s) + 15 = 0$$

$$20s^2 + s - 13 = 0$$

$$s = \frac{-1 \pm \sqrt{1^2 - (4)(20)(-13)}}{2(20)}$$

$$s = 0.782 \text{ ft}$$