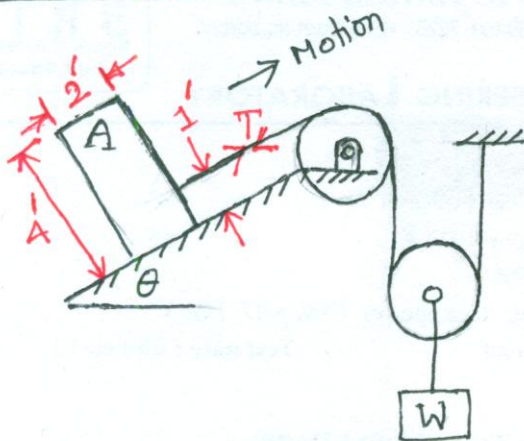


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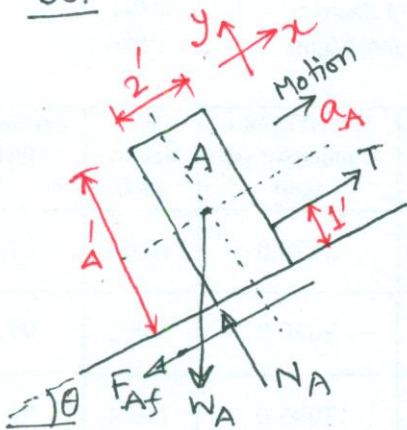
$$W_A = 1200 \text{ lb}$$

$$\theta = 30^\circ$$

$$f_A = 0.3$$

- (a) $W = ?$ } body A is on
 (b) $T = ?$ } the point of
 turning over

Solⁿ



From the freebody of A considering $\Sigma F_y = 0$, +ve y directⁿ as +ve

$$N_A - W_A \cos 30^\circ = 0$$

$$\therefore N_A = 1200 \times \cos 30^\circ = 1039.2 \text{ lb}$$

$$\therefore F_{Af} = N_A \cdot f_A = 1039.2 \times 0.3 = 311.77 \text{ lb}$$

Again for body A, $\Sigma M_{cg} = 0$ \curvearrowright +ve

$$-T \times 1 + N_A \times 1 + F_{Af} \times 2 = 0$$

$$\Rightarrow -T + 1039.2 \times 1 + 311.77 \times 2 = 0$$

$$\therefore T = \boxed{1662.74 \text{ lb}} \text{ Ans.}$$

For body A, considering $\Sigma F_x = ma$, +ve x directⁿ as +ve

$$T - W_A \sin \theta - F_{Af} = \frac{W_A}{g} \cdot a_A$$

$$\Rightarrow 1662.74 - 1200 \sin 30^\circ - 311.77 = \frac{1200}{32.2} \times a_A$$

$$\therefore a_A = 20.15 \text{ fps}^2$$

From the freebody of W, $\Sigma F = ma$ \downarrow +ve gives

$$W - 2T = \frac{W}{g} \cdot \frac{a_A}{2}$$

$$\Rightarrow W - 2 \times 1662.74 = \frac{W}{32.2} \times \frac{20.15}{2}$$

$$\therefore W = \boxed{4839.79 \text{ lb}} \text{ Ans.}$$

