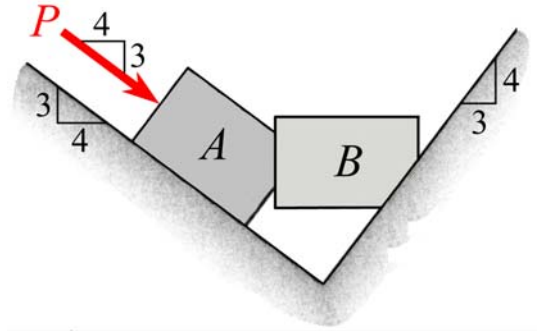


MEEG 2003 Quiz #9.m24.073

1. Give a brief summary of the *laws of dry friction*. ②
2. The 30-lb block *A* and the 25-lb block *B* are initially at rest as shown, where μ_s is 0.2 between all surfaces of contact. If the applied force \mathbf{P} causes block *A* to have an impending motion down the incline, determine its magnitude P . ⑧



2. FBD for block *B* ②

$$\pm \Sigma F_x = 0: -\frac{4}{5}N_1 - \frac{3}{5}(0.2N_1) + N_2 = 0$$

$$+\uparrow \Sigma F_y = 0: \frac{3}{5}N_1 - \frac{4}{5}(0.2N_1) - 0.2N_2 - 25 = 0$$

$$N_1 = 97.65625 \text{ lb} \quad N_2 = 89.84375 \text{ lb} \quad \textcircled{2}$$

FBD for block *A* ②

$$\pm \Sigma F_x = 0: \frac{3}{5}N_3 - \frac{4}{5}(0.2N_3) + \frac{4}{5}P - N_2 = 0$$

$$+\uparrow \Sigma F_y = 0: \frac{4}{5}N_3 + \frac{3}{5}(0.2N_3) - \frac{3}{5}P + 0.2N_2 - 30 = 0$$

$$N_3 = 63.53125 \text{ lb} \quad P = 77.3625 \text{ lb}$$

$$P = 77.4 \text{ lb} \quad \textcircled{2}$$