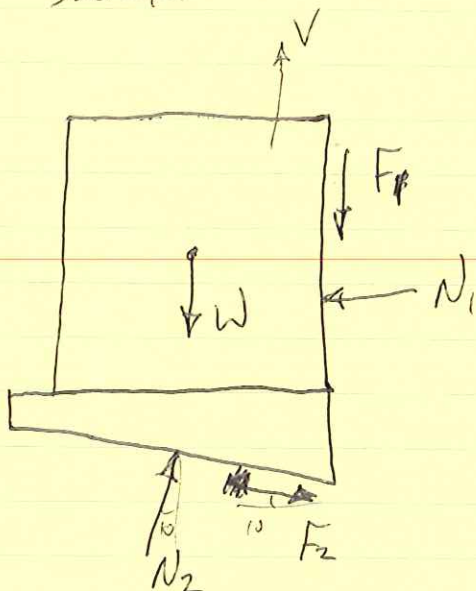


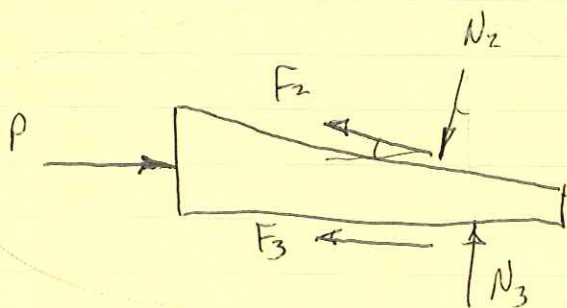
PROB. 8.64

FBD: BLOCK



$$N_1 = 0.42 N_2 \quad (1)$$

FBD: LOWER WEDGE



$$-0.25(0.42 N_2) + 0.941 N_2 = 400$$

$$N_2 = 478 \text{ LB}$$

$$\mu_s = 0.25$$

FIND  $P_{\min}$

$$\Sigma F_x = 0: -N_1 + N_2 \sin 10^\circ + F_2 \cos 10^\circ = 0$$

$$-N_1 + 0.174 N_2 + 0.985 F_2 = 0$$

$$F_2 = \mu_s N_2 = 0.25 N_2$$

$$-N_1 + 0.174 N_2 + 0.246 N_2 = 0$$

$$-N_1 + 0.420 N_2 = 0$$

$$\Sigma F_y = 0: +F_1 + W$$

$$-F_1 - W + N_2 \cos 10^\circ - F_2 \sin 10^\circ = 0$$

$$F_1 = \mu_s N_1 = 0.25 N_1$$

$$-0.25 N_1 - W + 0.985 N_2$$

$$- (0.25 N_2)(0.174) = 0$$

$$-0.25 N_1 + 0.941 N_2 = 400$$

PROB. 8-64 CONT.

11

FBD: LOWER WEDGE

$$\Sigma F_x = 0: P - F_2 \cos 10^\circ - F_3 - N_2 \sin 10^\circ = 0$$

$$P = 0.984(0.25N_2) + (0.25N_3) + 0.174N_2$$

$$P = 0.42N_2 + 0.25N_3$$

$$\Sigma F_y = 0: -N_2 \cos 10^\circ + F_2 \sin 10^\circ + N_3 = 0$$

$$-0.985N_2 + (0.174)(0.25N_2) + N_3 = 0$$

$$N_3 = 0.941N_2$$

$$P = 0.42N_2 + 0.25(0.941N_2) = 0.655N_2$$

$$\boxed{P = 0.655(478 \text{ LB}) = 313 \text{ LB}}$$