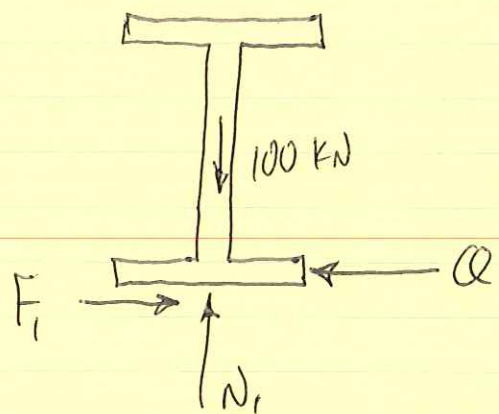


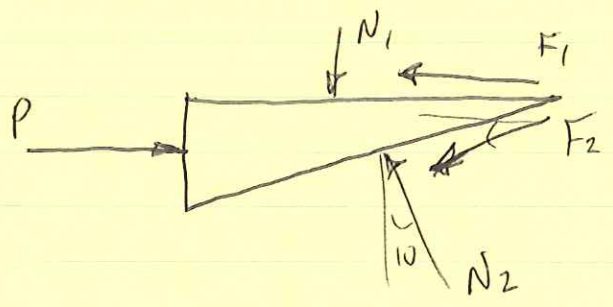
PROB. 8.66

FBD I-BEAM



$$N_i = 100 \text{ kN}, \quad Q = F_1 = 0.3 N_i = 0.3(100 \text{ kN}) = 30 \text{ kN}$$

FBD WEDGE E:



$$\sum F_x = 0: P - F_1 - F_2 \cos 10^\circ - N_2 \sin 10^\circ = 0$$

$$P = 30 + [(0.3)(\cos 10^\circ) + \sin 10^\circ] N_2$$

$$P = 30 + 0.469 N_2$$

$$\sum F_y = 0: -N_i + N_2 \cos 10^\circ - F_2 \sin 10^\circ = 0$$

$$N_2 [\cos 10^\circ - (0.3) \sin 10^\circ] = 100$$

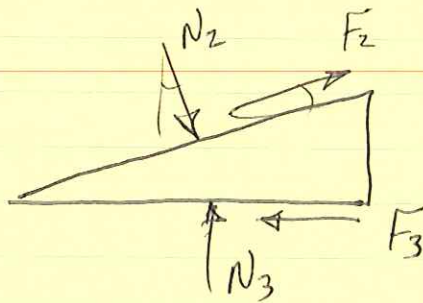
$$N_2 = 107 \text{ kN}, \quad P = 80.3 \text{ kN}$$

8.66

(13) (14)

CHECK TO SEE IF WEDGE F WILL
SLIDE OVER CONCRETE:

FBD WEDGE F:



$$\sum F_x = 0: N_2 \sin 10^\circ + F_2 \cos 10^\circ - F_3 = 0$$

$$F_3 = (107) \sin 10^\circ + (0.3)(107) \cos 10^\circ = 50.2 \text{ kN}$$

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

~~$F_{\text{max}} = \mu N$~~

$$N_3 = (107) \cos 10^\circ - (0.3)(107) \sin 10^\circ = 99.8 \text{ kN}$$

(SHOULD BE 100 kN)

$$F_{\text{max}} = \mu_s N_3 = (0.6)(100 \text{ kN}) = 60 \text{ kN}$$

SINCE $F_3 < F_{\text{max}}$, WEDGE IS IN EQUILIBRIUM

AND WILL NOT MOVE.