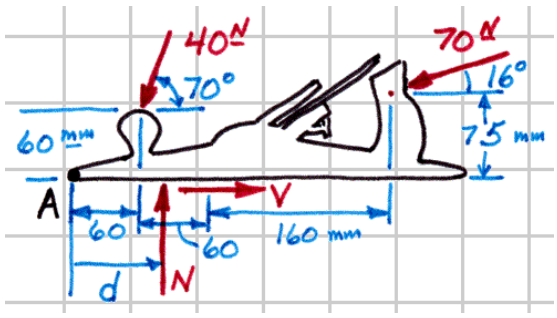
1-16

(a) From a free-body diagram of the plane, the force equilibrium equations are solved to get the forces



$$\rightarrow \Sigma F_x = 0: \qquad V - 40\cos 70° - 70\cos 16° = 0$$

$$\uparrow \Sigma F_y = 0: \qquad N - 40\sin 70° - 70\sin 16° = 0$$

$V = 81.0$ N ..... **Ans.**

$N = 56.882$ N $\cong 56.9$ N ..... **Ans.**

(b) Then the moment equilibrium equation gives the required location of the normal force

$$\circlearrowleft \Sigma M_A = 0: \qquad (70\cos 16°)(75) - (70\sin 16°)(280) + Nd$$

$$+ (40\cos 70°)(60) - (40\sin 70°)(60) = 0$$

$d = 31.5$ mm

31.5 mm (from the left end of plane) ..... **Ans.**