

1-57*

From an overall free-body diagram of the bracket, the equations of equilibrium give

$$\rightarrow \Sigma F_x = 0: \quad A_x + B \cos 45^\circ = 0$$

$$\uparrow \Sigma F_y = 0: \quad A_y + B \sin 45^\circ - 500 = 0$$

$$\curvearrowright \Sigma M_A = 0: \quad 5(500) - 15(B \cos 45^\circ) - 15(B \sin 45^\circ) = 0$$

$$B = 117.85113 \text{ lb}$$

$$A_x = -83.3333 \text{ lb} \quad A_y = 416.6667 \text{ lb}$$

Next, draw a free-body diagram of the portion of the bracket between section *a-a* and pin *A*. The equations of equilibrium give

$$\rightarrow \Sigma F_x = 0: \quad V - 83.3333 = 0$$

$$\uparrow \Sigma F_y = 0: \quad P + 416.6667 = 0$$

$$\curvearrowright \Sigma M_a = 0: \quad M - 8(83.3333) = 0$$

$$P = -417 \text{ lb} = 417 \text{ lb (C)} \dots\dots\dots \text{Ans.}$$

$$V = 83.3 \text{ lb} \dots\dots\dots \text{Ans.}$$

$$M = 667 \text{ lb} \cdot \text{in.} \dots\dots\dots \text{Ans.}$$

