Statics Handout #1:

Homework #1 Assignment: 2.22, 2.24, 2.26, 2.30, 2.46, 2.58, 2.66

2.21 and 2.22 Determine the x and y components of each of the forces shown.

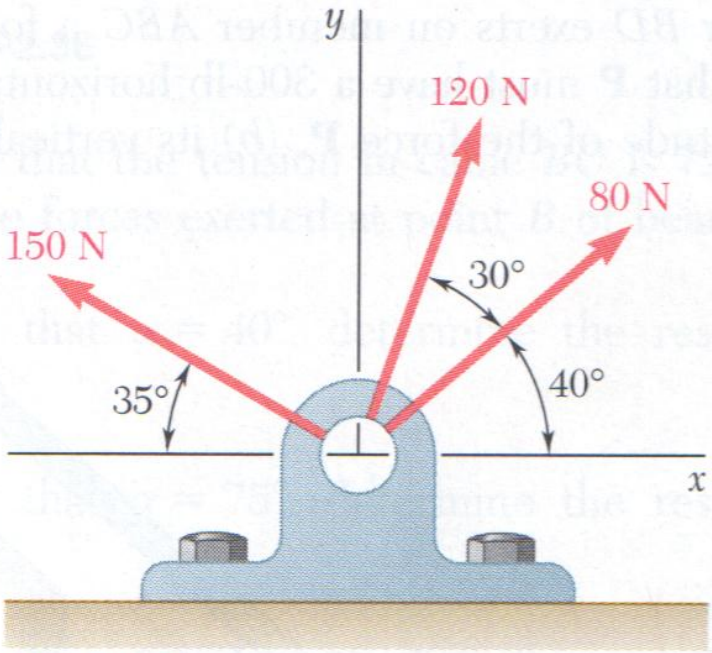

Fig. P2.21

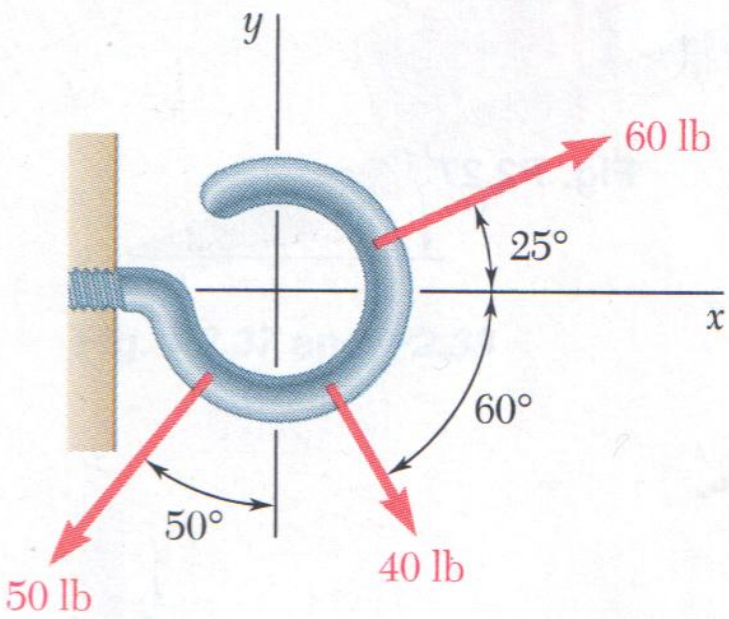

Fig. P2.22

2.23 and *2.24* Determine the x and y components of each of the forces shown.

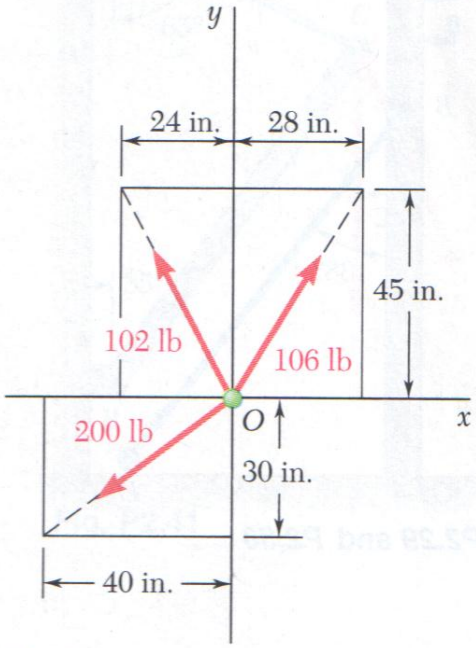

Fig. P2.23

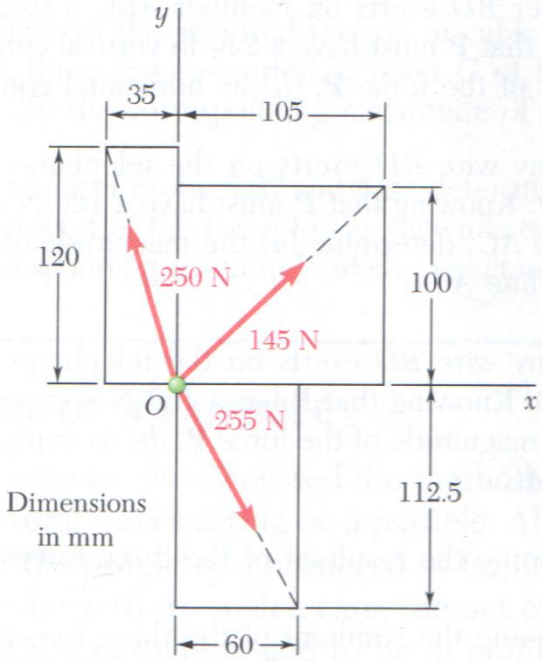

Fig. *P2.24*

2.25 Member CB of the vise shown exerts on block B a force **P** directed along line CB. Knowing that **P** must have a 1200-N horizontal component, determine (a) the magnitude of the force **P**, (b) its vertical component.

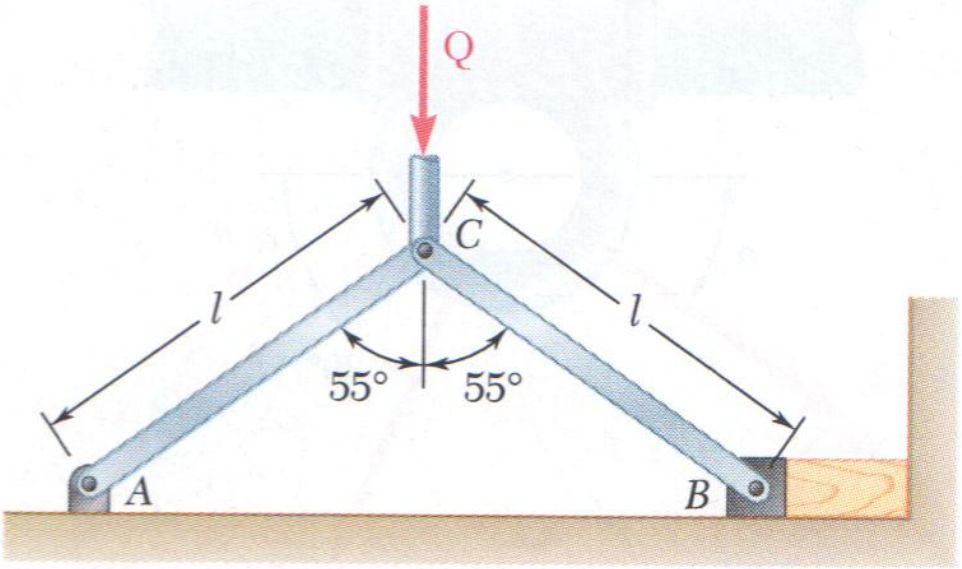

Fig. P2.25

2.26 The hydraulic cylinder BC exerts on member AB a force **P** directed along line BC. Knowing that **P** must have a 600-N component perpendicular to member AB, determine (a) the magnitude of the force **P**, (b) its component along line AB.

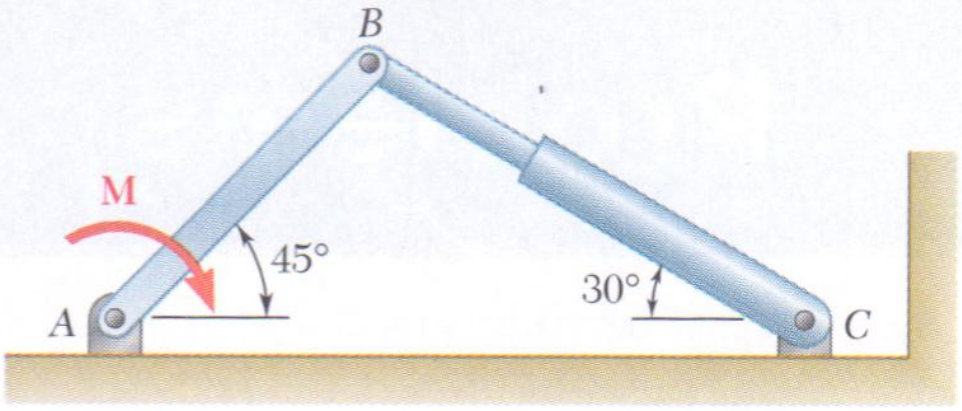

Fig. P2.26

2.29 The guy wire BD exerts on the telephone pole AC a force **P** directed along BD. Knowing that **P** must have a 120-N component perpendicular to the pole AC, determine (a) the magnitude of the force **P**, (b) its component along line AC.

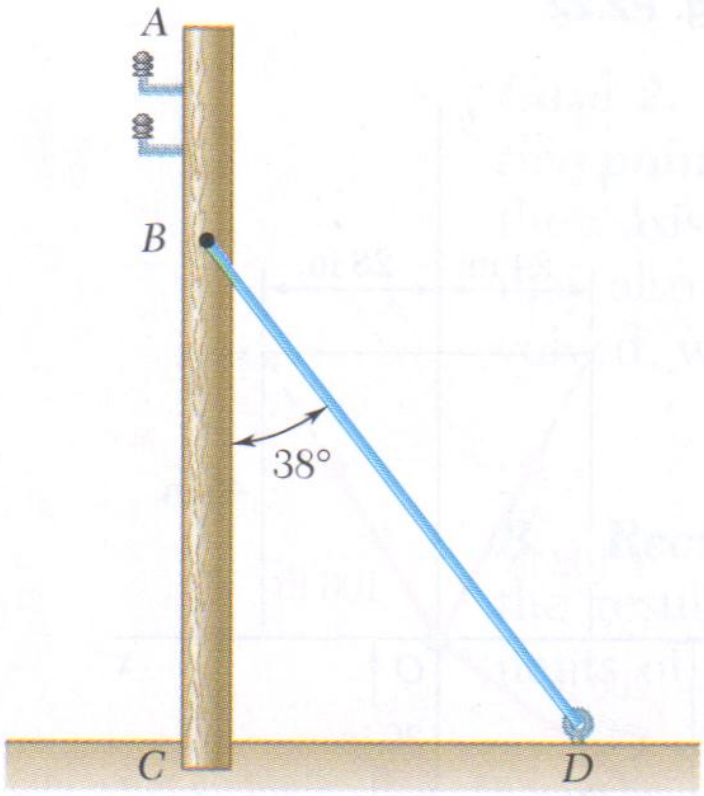

Fig. *P2.29* and *P2.30*

2.30 The guy wire BD exerts on the telephone pole AC a force **P** directed along BD. Knowing that **P** has a 180-N component along line AC, determine (a) the magnitude of the force **P**, (b) its component in a direction perpendicular to AC.

2.45 Knowing that $\alpha = 20°$, determine the tension (*a*) in cable *AC*, (*b*) in rope *BC*.

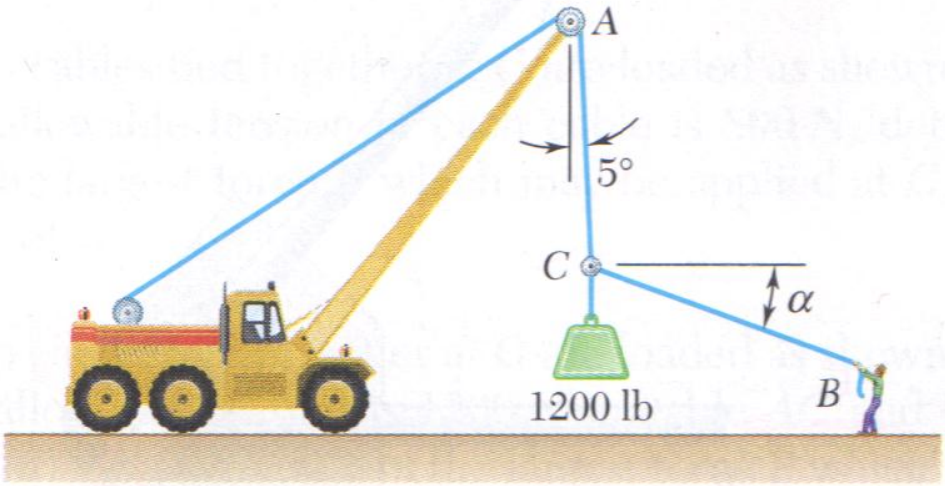

Fig. P2.45

2.46 Knowing that $\alpha = 55°$ and that boom AC exerts on pin C a force directed along line AC, determine (*a*) the magnitude of that force, (*b*) the tension in cable BC.

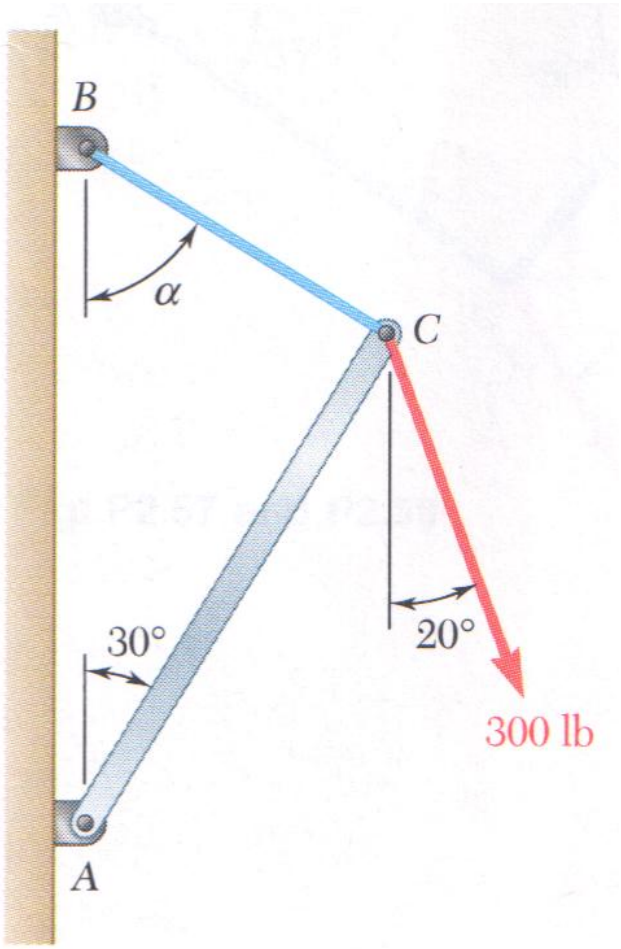

Fig. P2.46

2.57 Two cables tied together at C are loaded as shown. Knowing that the maximum allowable tension in each cable is 800 N, determine (*a*) the magnitude of the largest force **P** which may be applied at C, (*b*) the corresponding value of α.

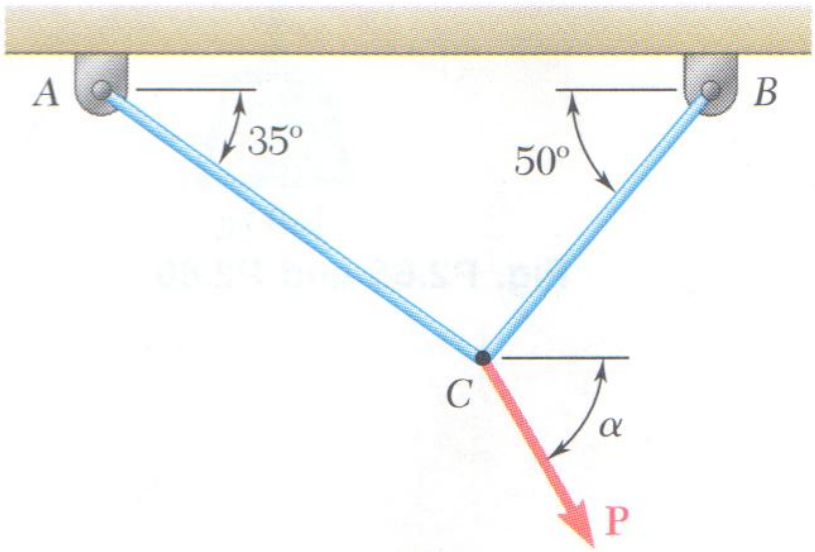

Fig. P2.57 and P2.58

2.58 Two cables tied together at C are loaded as shown. Knowing that the maximum allowable tension is 1200 N in cable AC and 600 N in cable BC, determine (*a*) the magnitude of the largest force **P** which may be applied at C, (*b*) the corresponding value of α.

2.65 A 160-kg load is supported by the rope-and-pulley arrangement shown. Knowing that $\beta = 20°$, determine the magnitude and direction of the force **P** which should be exerted on the free end of the rope to maintain equilibrium. (*Hint.* The tension in the rope is the same on each side of a simple pulley. This can be proved by the methods of Chap. 4.)

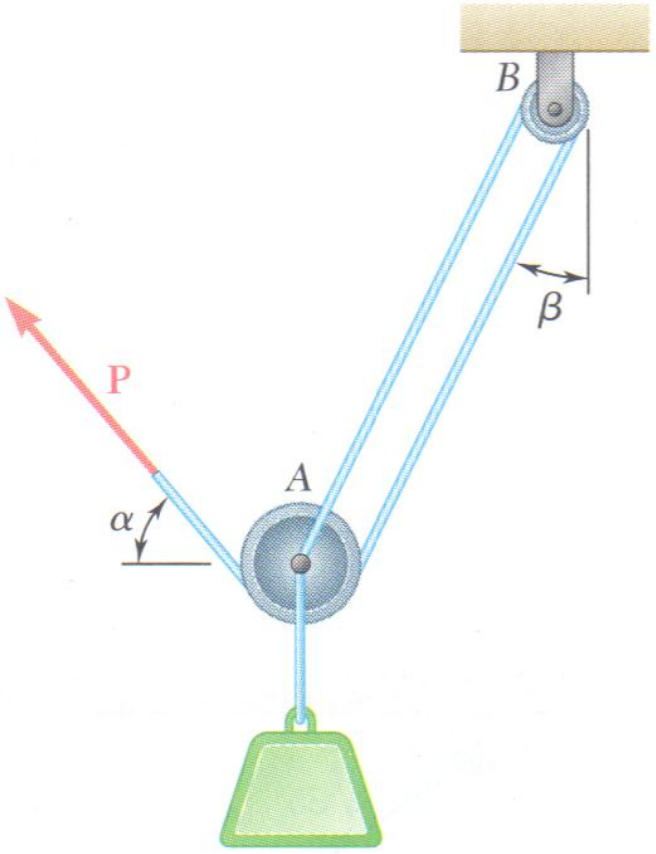

Fig. P2.65 and P2.66

2.66 A 160-kg load is supported by the rope-and-pulley arrangement shown. Knowing that $\alpha = 40°$, determine (*a*) the angle β, (*b*) the magnitude of the force **P** which should be exerted on the free end of the rope to maintain equilibrium. (See the hint for Prob. 2.65.)