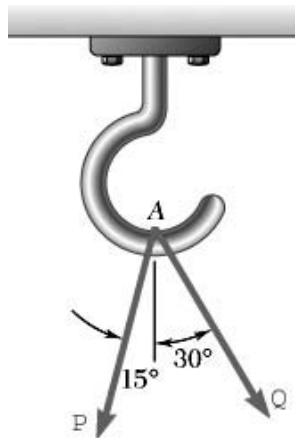


PROBLEM 2.5

Two control rods are attached at A to lever AB . Using trigonometry and knowing that the force in the left-hand rod is $F_1 = 120 \text{ N}$, determine (a) the required force F_2 in the right-hand rod if the resultant \mathbf{R} of the forces exerted by the rods on the lever is to be vertical, (b) the corresponding magnitude of \mathbf{R} .

[(a) 107.6 N (b) 75.0 N]

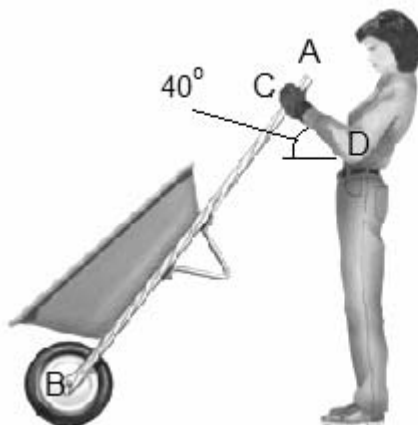


PROBLEM 2.18

Solve the problem using trigonometry

Two forces \mathbf{P} and \mathbf{Q} are applied as shown at point A of a hook support. Knowing that $P = 60 \text{ N}$ and $Q = 100 \text{ N}$, determine graphically the magnitude and direction of their resultant using (a) the parallelogram law, (b) the triangle rule.

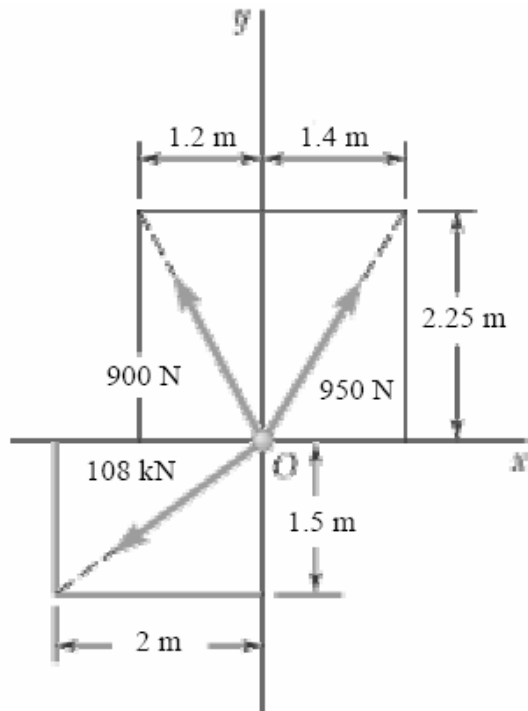
[148.6 N \searrow 76.6°]



PROBLEM 2.25

While emptying a wheelbarrow, a gardener exerts on each handle AB a force \mathbf{P} directed along line CD . Knowing that \mathbf{P} must have a 135-N horizontal component, determine (a) the magnitude of the force \mathbf{P} , (b) its vertical component.

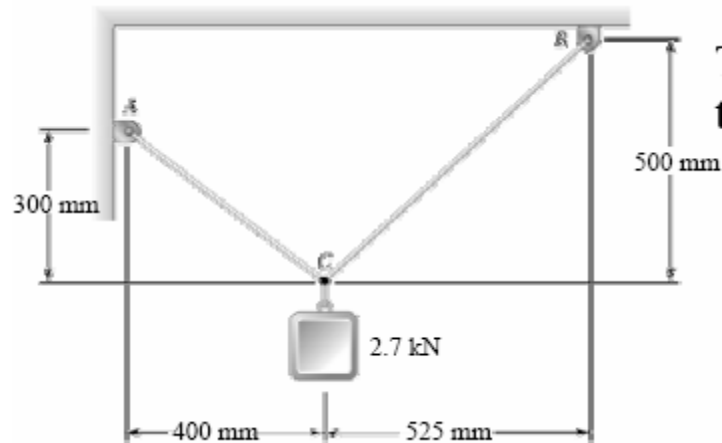
[(a) 176.2 N (b) 113.3 N]



PROBLEM 2.34

Determine the resultant of the three forces in Problem 2.34

[1160 N \searrow 6.68°]

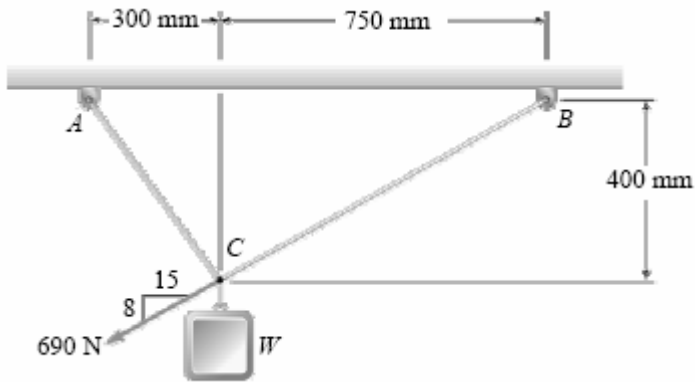


PROBLEM 2.43

Two cables are tied together at C and are loaded as shown. Determine the tension (a) in cable AC , (b) in cable BC .

[(a) 1984 N

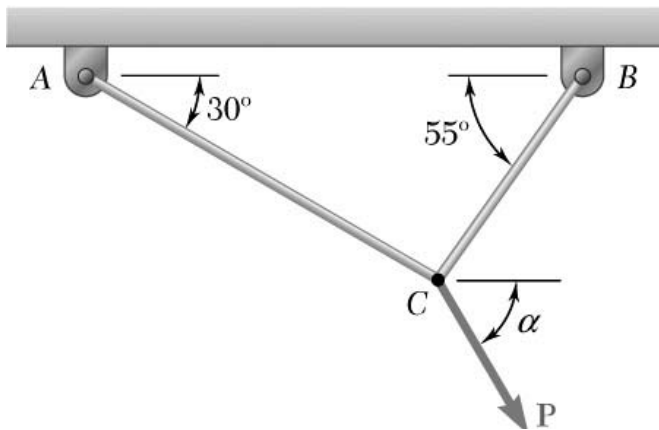
(b) 2191 N]



PROBLEM 2.54

Two cables tied together at C are loaded as shown. Determine the range of values of W for which the tension will not exceed 1050 N in either cable.

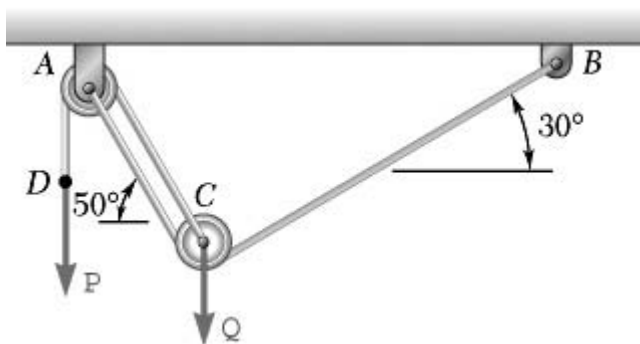
$$[0 \leq W \leq 609 \text{ N}]$$



PROBLEM 2.61

Two cables tied together at C are loaded as shown. Knowing that the maximum allowable tension in each cable is 900 N, determine (a) the magnitude of the largest force \mathbf{P} which may be applied at C , (b) the corresponding value of α .

$$[(a) 1215 \text{ N} \quad (b) 77.5^\circ]$$



PROBLEM 2.71

A load \mathbf{Q} is applied to the pulley C , which can roll on the cable ACB . The pulley is held in the position shown by a second cable CAD , which passes over the pulley A and supports a load \mathbf{P} . Knowing that $P = 800 \text{ N}$, determine (a) the tension in cable ACB , (b) the magnitude of load \mathbf{Q} .

$$[(a) 2.30 \text{ kN} \quad (b) 3.53 \text{ kN}]$$