

# Forces – 3 – Tutorial

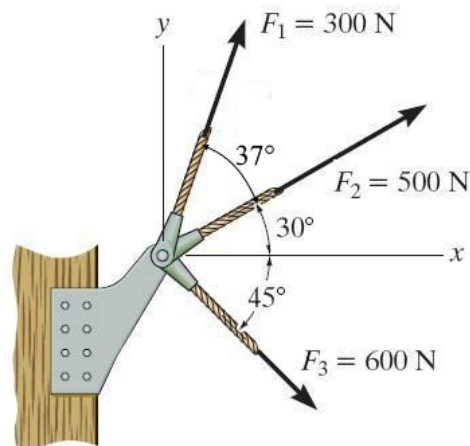
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1. Calculate the resultant of the following five co-planar forces.  
Angles are measured anticlockwise from the positive x-direction.

Force A = 15N at  $0^\circ$ ,  
Force B = 23N at  $81^\circ$ ,  
Force C = 7N at  $210^\circ$ ,  
Force D = 9N at  $265^\circ$ ,  
Force E = 28N at  $324^\circ$ .

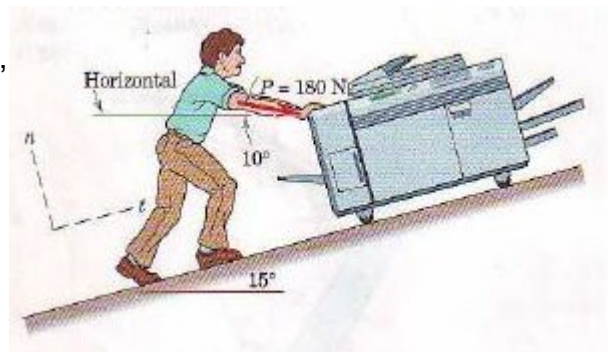
*(35N at  $-10^\circ$  to the horizontal)*

2. Calculate the resultant force on the bracket. *(978N,  $+6^\circ$  to x-direction)*

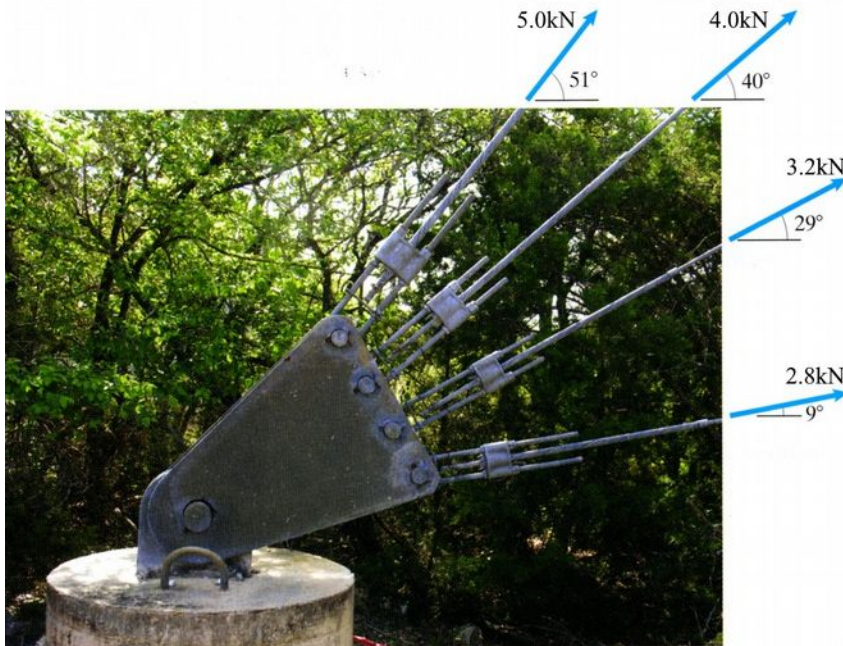


3. While steadily pushing a machine up a  $15^\circ$  incline, a person pushes downwards, with a 180N force at  $10^\circ$  below the horizontal, as shown.

Calculate the components of the force parallel and perpendicular to the incline.  
*(para=163N, perp=76N)*



4. Calculate the resultant force exerted by the four cables on the anchor point.  
(14.5kN)



5. A six-metre column is held vertical by three cables A, B, C, attached to the top, as shown. The tensions in all three cables are the same. The resultant force on the column from the three cables is 200kN.

Calculate the value of the tension in one of the cables.  
(68kN)

