$\overline{A}$
410 N 33°
$\overline{B}$ 360 N
D

(1) Two forces $\overline{A}$ and $\overline{B}$, of A=410N and B=360N are exerted on point D as shown. What is a) the magnitude, and b) the direction of the resultant force?

37° $\overline{A}$

y

x
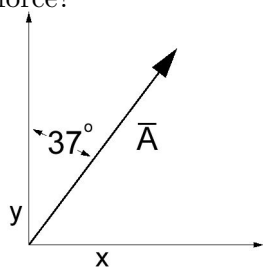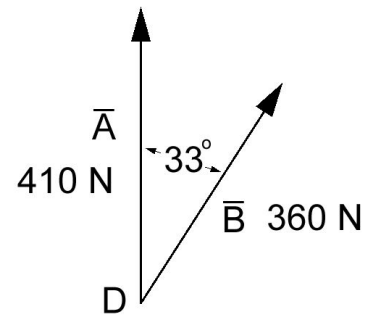
(2) A force of 382 lb. is oriented $37°$ off the y axis as shown. What are the x and y components of $\overline{A}$?

(3) The support assembly shown is bolted in place at B, C, and D, and supports a downward force P at A. Knowing the forces in members AB, AC, and AD are directed along the respective members and that the force in member AB is 146N, what is the magnitude of force P?

96 mm
192 mm
192 mm
220 mm
144 mm

P
A
400 mm
O
B
Q
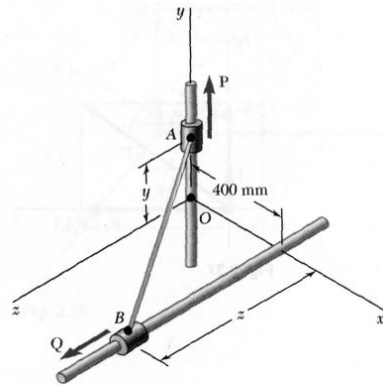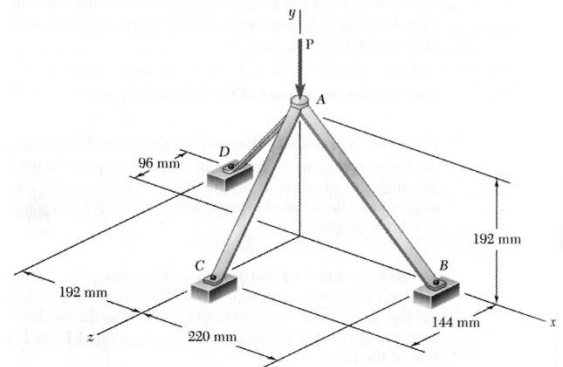
(4) Collars A and B are connected by a 1-m-long wire and can slide freely on frictionless rods. If a force $\overline{P} = \hat{\jmath}\, 680N$ is applied at A, determine (a) the tension in the wire when y = 300mm, (b) the magnitude of the force Q required to maintain the equilibrium of the system.

A 16.8 m 28.8 m 7.2 m
9.9 m
B
E
12 m
C
F D
1.32 m

(5) A chair lift has been stopped in the position shown. Knowing that each chair weighs 300 N and that the skier in chair E weighs 890 N, determine the weight of the skier in chair F.
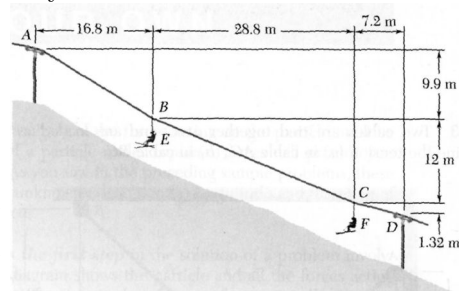
(6) There are 3 coplanar forces acting on a lead sphere with a mass of 15 kg: $\overline{F}_1 = 80.0$ N in the -x direction, $\overline{F}_2 = 20.0$ lb in the +y direction, and the third is the weight of the sphere. Assume Earth gravity is acting in the -y direction. a) Draw the FBD of the problem. b) What is the equivalent force acting on the system? c) At what angle does the equivalent force act on the system relative to the +y axis?