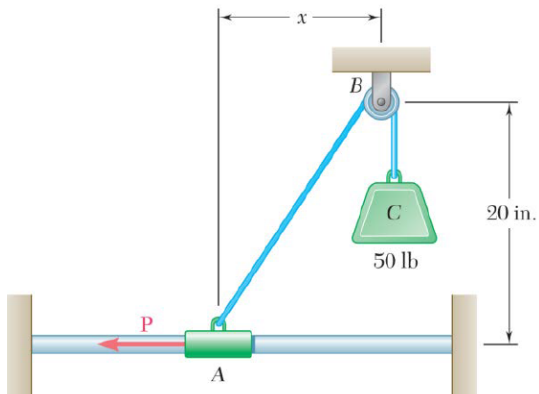




This is just a



1. [15 pts]

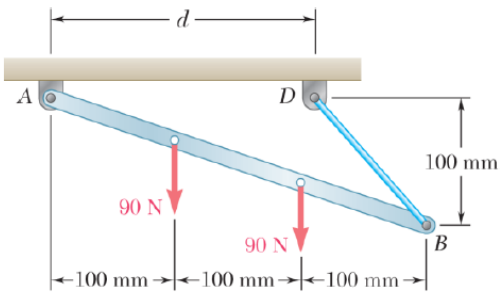


Collar *A* is connected as shown to a 50-lb load and can slide on a frictionless horizontal rod. Determine the distance *x* for which the collar is in equilibrium when $P = 48$ lb.

2.[15 pts]

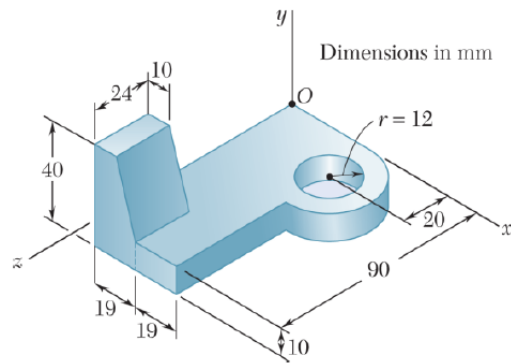
Determine the moment about the origin O of the force $\mathbf{F} = 4\mathbf{i} - 3\mathbf{j} + 5\mathbf{k}$ that acts at a Point A . Assume that the position vector of A is (a) $\mathbf{r} = 2\mathbf{i} + 3\mathbf{j} - 4\mathbf{k}$, (b) $\mathbf{r} = -8\mathbf{i} + 6\mathbf{j} - 10\mathbf{k}$, (c) $\mathbf{r} = 8\mathbf{i} - 6\mathbf{j} + 5\mathbf{k}$.

3. [15 pts]



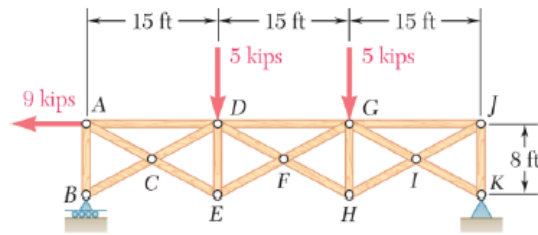
A rod AB , hinged at A and attached at B to cable BD , supports the loads shown. Knowing that $d = 150\text{ mm}$, determine (a) the tension in cable BD , (b) the reaction at A .

4. [15 pts]



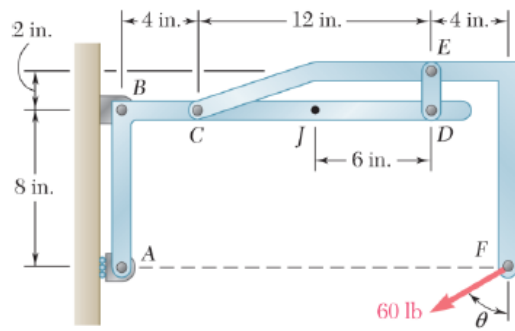
For the machine element shown, locate the x coordinate of the center of gravity.

5. [20 pts]



Determine the force in members DG , FG , and FH of the truss shown.

6. [20 pts]



Determine the components of all forces acting on member $ABCD$ when $\theta = 90^\circ$.