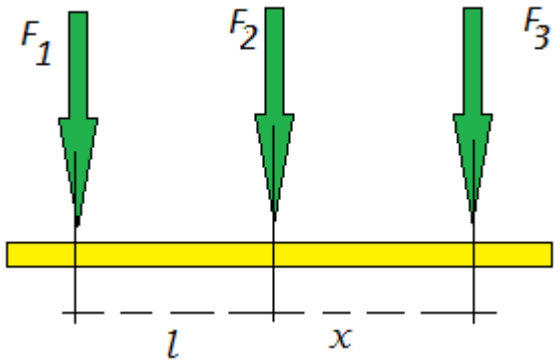
Answer on Question #62362, Physics / Mechanics | Relativity

A rod of length of 5N &10N acting dawn wards find were a third force should be placed for the rod to be in equilibrium? What is the magnitude of this force?

Solution:

Schematic drawing



The third force acts as a balancing force.

The point of application of the balancing forces lies on the straight line joining the points of application of force F_1 and F_2 the right of a greater force.

With a known distance between the forces. You can find the location of the point of a third force. Then, according to the rule of moments we have:

$$F_1(l + x) - F_2(x)$$

$$x = \frac{F_1 l}{F_2 - F_1}$$

The module balances is equal to the difference of the modules acting on the rod force:

$$F = F_2 - F_1 = 10 - 5 = 5\,N$$

Answer:5 N