The center of mass of a person may be determined by an arrangement -lady laying on flat board. A light plank rests on two scales separated by a distance of d =1.80 m and reading Fg1=500n and Fg2=270n. Determine the distance of the girl's center of mass from her feet.

Solution

We neglect the weight of the board and assume that the woman's feet are directly above the point of support by the rightmost scale.

From $\sum F_y = 0$, we have

$$F_1 + F_2 - W = 0 \; or \; W \; = 500 + 270 = 770 \, N \, .$$

Then $\sum \tau = 0$ gives

$$Wx - F_1 d = 0$$

$$x = \frac{F_1 d}{W} = \frac{(500)(1.8)}{770} = 1.17 \, m.$$

Answer: $1.17 \, m.$