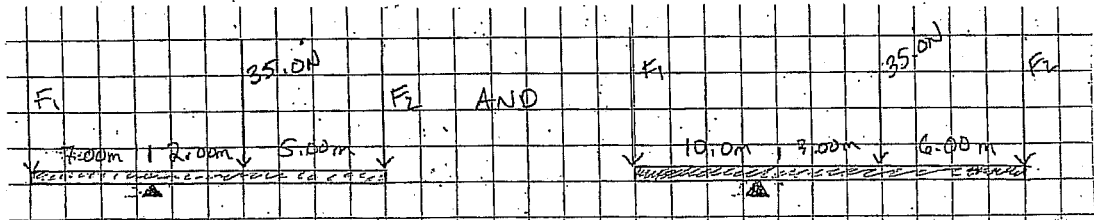


Quiz 9

Question 1. (10 marks) The following are in equilibrium, find the missing forces or distances (round to 3 decimal places).

(a)



$$\sum \vec{M} = \vec{0}$$

$$7.00F_1 = 2(35.0) + 7.00F_2$$

$$7F_1 = 70 + 7F_2 \quad (1)$$

$$\Rightarrow F_1 = 10 + F_2$$

$$\sum \vec{M} = \vec{0}$$

$$10.0F_1 = (3.00)(35.0) + 9.00F_2$$

$$10F_1 = 105 + 9F_2 \quad (2)$$

$$(2) \quad 10(10 + F_2) = 105 + 9F_2$$

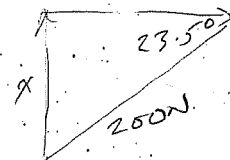
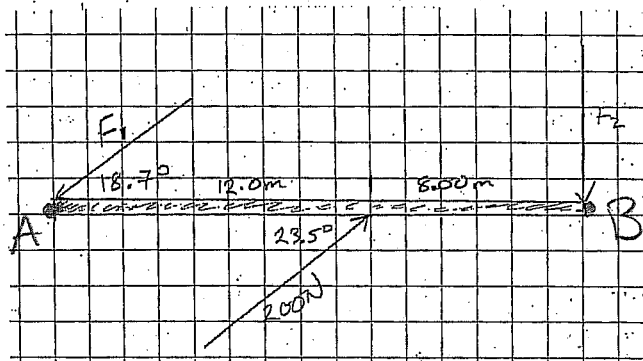
$$100 + 10F_2 = 105 + 9F_2$$

$$F_2 = 5.00\text{N}$$

$$F_1 = 10 + 5$$

$$= 15.0\text{N}$$

(b)



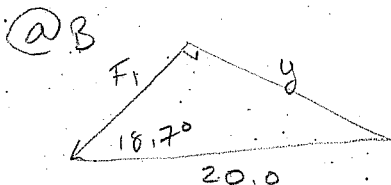
$$X = 200 \sin 23.5^\circ$$

$$= 79.7\text{N}$$

$$\textcircled{A} \quad \sum \vec{M} = \vec{0}$$

$$20.0F_2 = 12.0(79.7)$$

$$F_2 = 47.8\text{N}$$



$$y = 20(\sin 18.7^\circ)$$

$$= 6.41\text{m}$$

$$\sum \vec{M} = \vec{0}$$

$$6.41F_1 = (79.7)(8.00)$$

$$F_1 = 99.5\text{N}$$