

Aliu QFA10 (2117368) (ACHA3000)

Q1:

A) Area =  $m^2$

b) Volume =  $m^3$

c) Mass =  $kg$

d) Force =  $N$

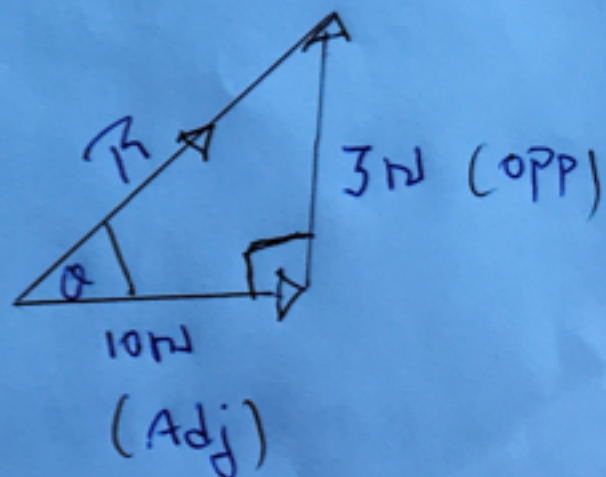
e) Weight =  $N$



Q2: Density =  $\frac{\text{Mass}}{\text{Volume}} = \frac{kg}{m^3} = kg/m^3$

Q3:

A)



$$R^2 = 5^2 + 10^2$$

$$R^2 = 25 + 100$$

$$R = \sqrt{125}$$

$$R = 11.18 \text{ N}$$

$$\tan \theta = \frac{\text{opp}}{\text{Adj}}$$

$$\tan \theta = \frac{5}{10}$$

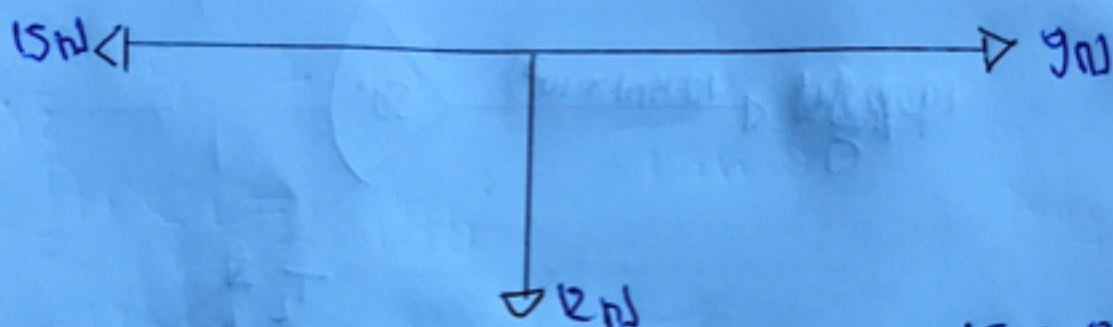
$$\theta = \tan^{-1}\left(\frac{5}{10}\right) = 26.57^\circ$$

$\therefore$  Resultant is 11.18 N to the right,  
26.57° above the horizontal.

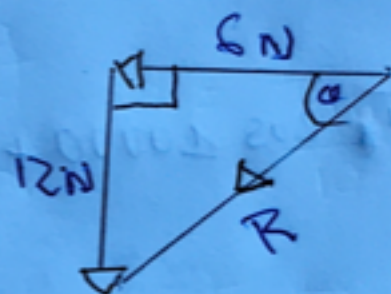
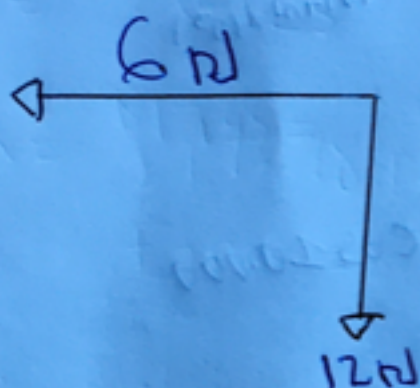
$$\begin{aligned} \text{Bearing } 90 - 26.57 \\ = 63.43^\circ \end{aligned}$$

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Q3:  
b)



$$-15 + 9 = -6$$



$$R^2 = 12^2 + 6^2$$

$$R^2 = 180$$

$$R = \sqrt{180}$$

$$R = 13.42 \text{ N}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

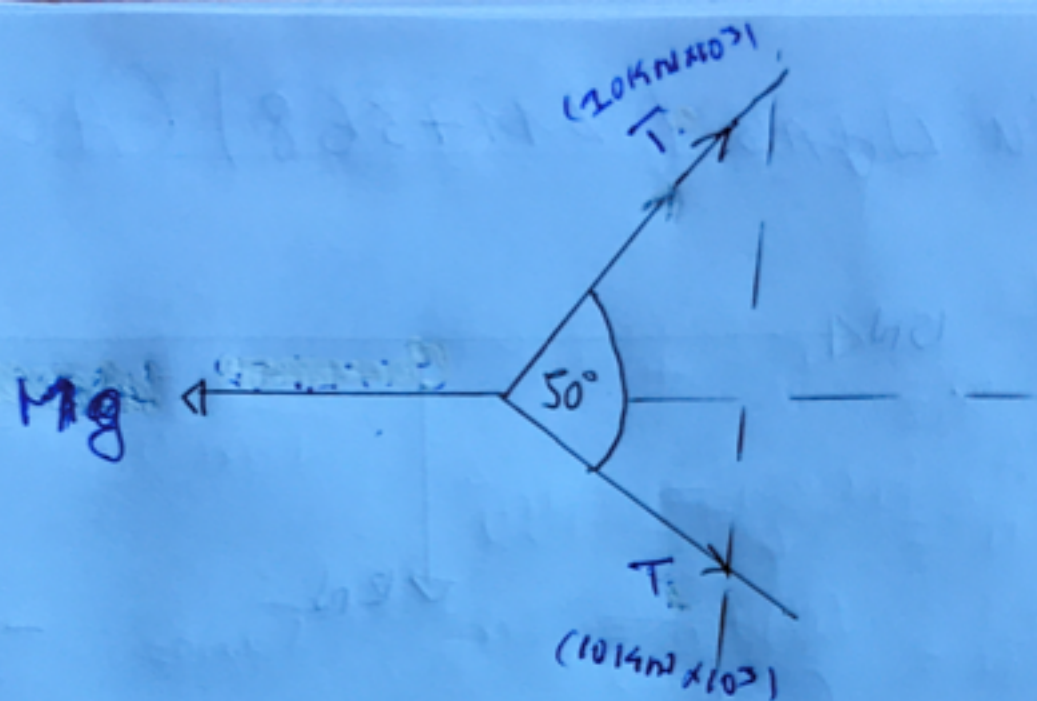
$$\tan \theta = \frac{12}{6}$$

$$\theta = \tan^{-1} \left( \frac{12}{6} \right) = 63.43^\circ$$

$\therefore$  The resultant is 13.42N to the left,  $63.43^\circ$  below the horizontal.

$$\begin{aligned} \text{Bearing} &= 270 - 63.43 \\ &= 206.57^\circ \end{aligned}$$

Q4:



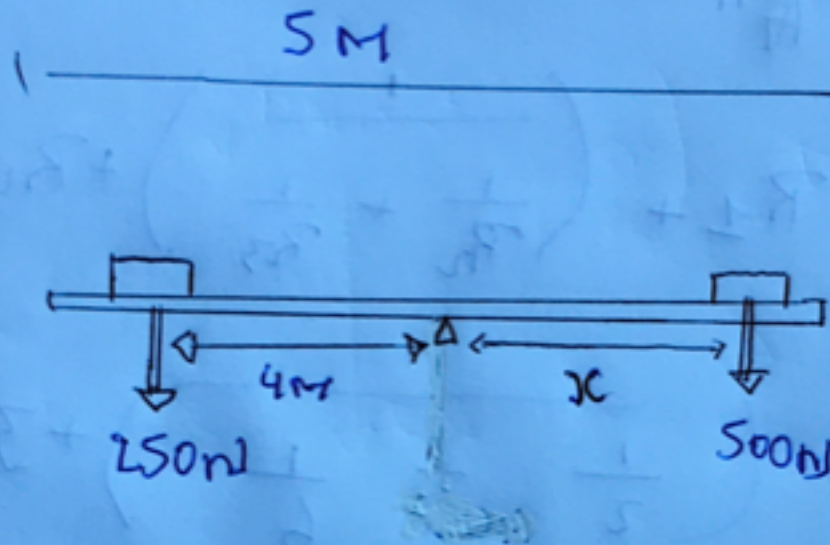
$$Mg = T \cos 10000 + T \cos 10000$$

$$\frac{Mg}{2 \cos 10000} = \frac{2T \cos 10000}{2 \cos 10000}$$

$$T = \frac{Mg}{2}$$

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Q5:



$$A) \quad ACWM = 250 \times 2.5 = 625 \text{ NM}$$

$$CW M = ACW$$

$$500 \times x = 250 \times 4$$

$$500 \times x = 1000$$

$$\frac{500 \times x}{500} = \frac{1000}{500}$$

$$x = 2 \text{ m}$$

A) To "A"

$$b) R_T = R_1 + \left( \frac{1}{\frac{1}{R_2} + \frac{1}{R_3}} \right) + R_4 =$$

$$0.5 + \left( \frac{1}{\frac{1}{2} + \frac{1}{6}} \right) + 3 = 5n$$

c)  $V = IR \therefore I = \frac{V}{R} = \frac{12}{5} = 2.4 \text{ A}$

d)  $V = IR = 2.4 \times 3 = 7.2 \text{ V}$

e) KVL

$$V_1 + V_2 + V_3 + V_4 = 0$$

$$12 - 7.2 + v_2 + v_3 = 0$$