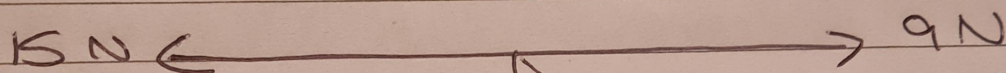
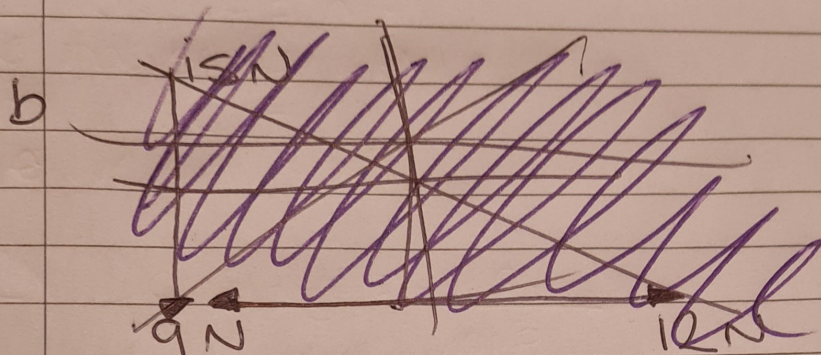


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resultant is 3.87 N to the right,
18.45° above the horizontal
bearing $90^\circ - 18.45 = 71.55$



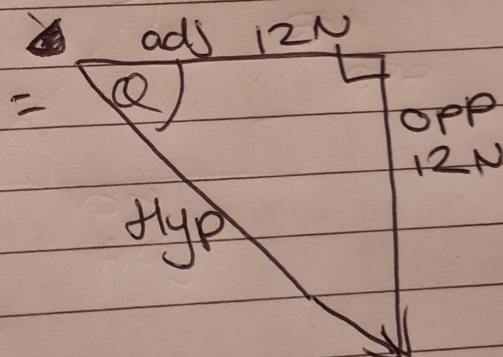
12 N

$$\text{resultant} = -15 + 9$$

$$\sum F^2 = 12^2 + 12^2 = 288$$

$$\sum F = \sqrt{288}$$

$$F = 16.97$$



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

$$\tan Q = \frac{12}{12}$$

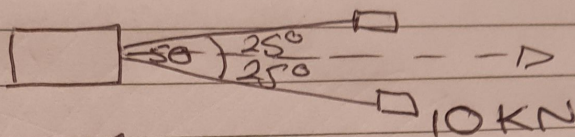
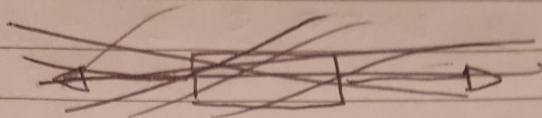
$$Q = \tan^{-1}\left(\frac{12}{12}\right) \quad Q = 45^\circ$$

resultant is 16.97 to the right 45°
below to the horizontal
bearing $= 90 + 45 = 135^\circ$

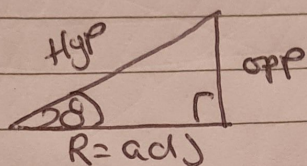
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6 negative to positive

4



$$\cos = \frac{\text{Adj}}{\text{Hyp}}$$



$$\cos 20 = \frac{R}{10000}$$

$$10000 \times \cos 20$$

$$R = 9396.92 \text{ N}$$

b $\therefore$ for 2 tug boats $= 2 \times 9396.92$
 $= 18793.84 \text{ N}$

$\therefore$ boat moves with constant
 Velocity $\therefore$ resultant of 2 boats
 $= \text{Drag} = 18793.84 \text{ N}$

1

a Area = m^2

b Volume = m^3

c mass = kg

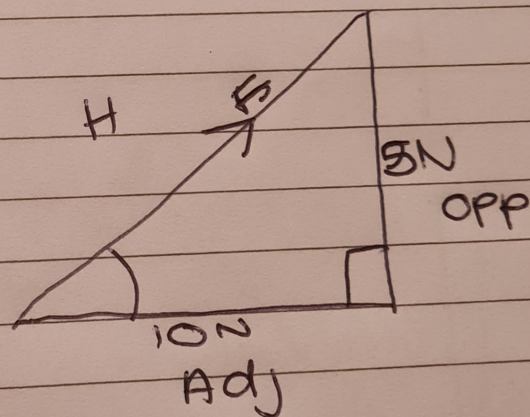
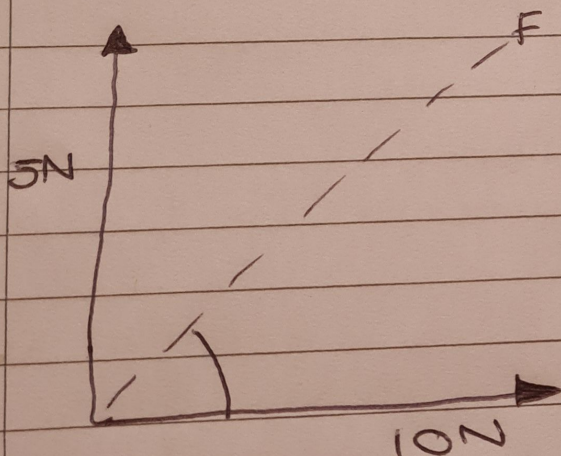
d force = N

• weight = N

2 Density = $\frac{kg}{m^3}$

3

A



$$\sum F^2 = 5 + 10 \quad F = \sqrt{15}$$

$$\sum F^2 = 15$$

$$F = 3.87N$$

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

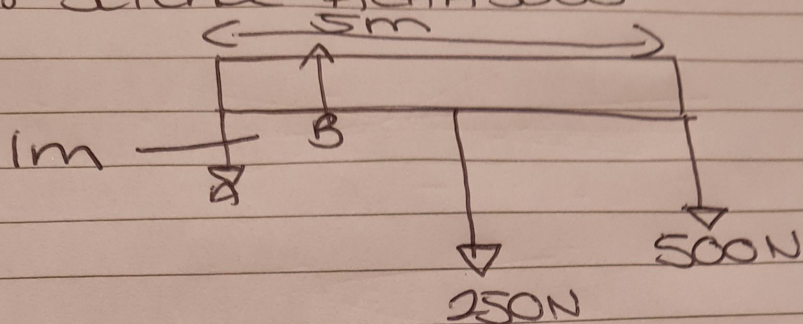
$$Q = \tan^{-1} \frac{5}{10}$$

$$Q = 18.45$$

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5.



a take moments about b
 $\text{Cwm} = \text{Acwm}$

$$((250 \times 1) + (500 \times 4)) = (A \times 1)$$
$$2250\text{N} = A$$

b take moments about A
 $\text{Cwm} = \text{Acwm}$

$$((250 \times 2) + (500 \times 5)) = (B \times 1)$$
$$3000\text{N} = B$$

forces up = forces down

$$3000 = 2250 + 250 + 500$$