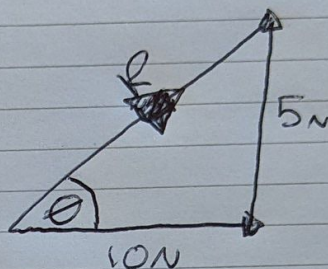
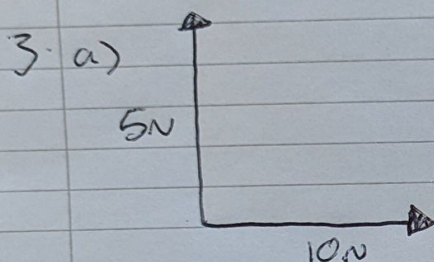


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1. a) m^2 b) m^3 c) kg d) N
e) N

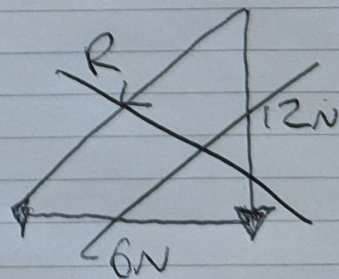
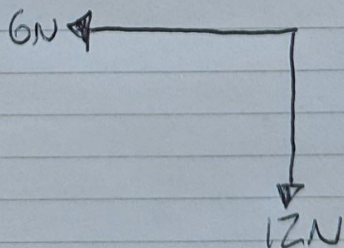
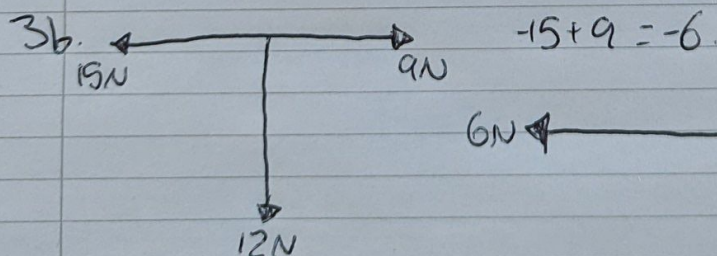
2. $\frac{kg}{m^3}$ kg/m^3



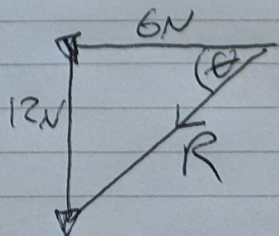
a. $R^2 = 5^2 + 10^2 = 125$
 $R = \sqrt{125}$
 $R = 11.18N$

$\theta = \tan^{-1} \frac{5}{10}$
 $\theta = 26.57^\circ$

$\therefore$ Resultant is ~~11.18N~~ 11.18N To the Right,
26.57° Above the horizontal
with a bearing of ~~26.57°~~ 63.43°



$R^2 = 12^2 + 6^2 = 180$
 $R = \sqrt{180}$
 $R = 13.42N$

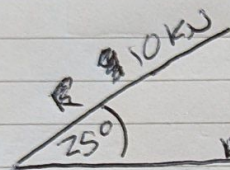
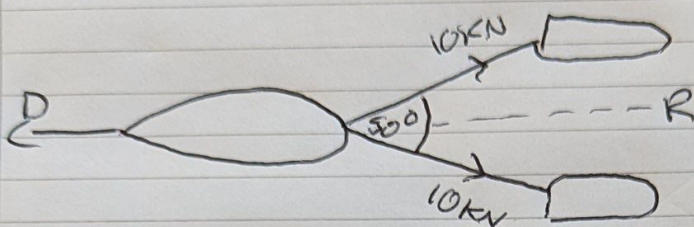


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b. $\theta = \tan^{-1} \frac{12}{6} = 63.43^\circ$

$\therefore$ Resultant is 13.42N to the left,
63.43° below the horizontal
with a bearing of 206.57°

4.



$$\cos 25 = \frac{R}{10kN}$$

$$10000 \times \cos 25 = R$$

$$9063.08 \text{ N}$$

a) $\therefore$ The force from the two tug boats is $\sqrt{18126.16 \text{ N}}$

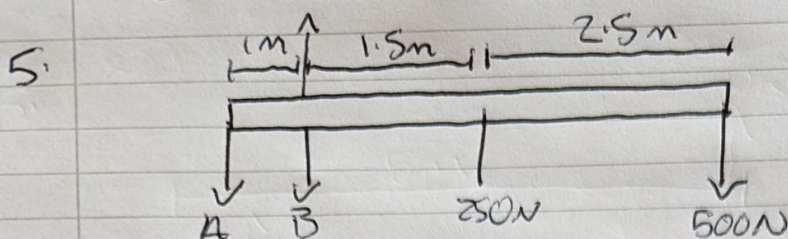
$$10 \times 10^3 \cos 25 = 9063.08 \text{ N}$$

b) The Drag on the ship must be equal

$$D = 9063.08 \text{ N} \quad \sqrt{18126.16 \text{ N}}$$

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P3



a) $\begin{array}{l} \text{Cwm} \\ 250 \times 1 + 500 \times 3.5 \\ 2000 \text{ N} \end{array} \quad \begin{array}{l} \text{ACwm} \\ (1 \times 1) \\ 1 \end{array}$

$250 \times 2.5 + 500 \times 5$

a) ~~2000 N~~ on the bolts

1875 N on the bolts

b) $\begin{array}{l} \text{Cwm} \\ 250 \times 2 \\ + 500 \times 8 \\ 3750 \text{ N} \\ 250 \times 2.5 \\ + 500 \times 5 \\ 3000 \text{ N} \end{array} \quad \begin{array}{l} \text{ACwm} \\ B \times 1 \end{array}$

$\begin{array}{l} \text{Cwm} \\ 250 \times 1.5 \\ + 500 \times 4 \\ 2375 \text{ N} \end{array} \quad \begin{array}{l} \text{ACwm} \\ B \times 1 \end{array}$

6a $\begin{array}{l} 3125 \text{ N} \\ 3000 \text{ N} \end{array} \quad \begin{array}{l} B \\ \text{edge of pool} \end{array}$
Positive to negative

b) $R_T = 0.5 + 2 + 6 + 3$

$R_T = 11.5 \Omega$

$0.5 + 3 + \frac{1}{\frac{1}{6} + \frac{1}{2}} = \sqrt{4.16 \Omega}$

c) $\frac{12}{4.16} = \sqrt{2.88 \text{ A}}$

d) $2.88 \text{ A} \times 3 = \sqrt{8.64 \text{ V}}$

e) $2.88 \text{ A} \times \left(\frac{1}{\frac{1}{6} + \frac{1}{2}} \right) = 1.92 \text{ V} \quad 1.92 \text{ V} \div 2 = \sqrt{0.96 \text{ A}}$

f) $\frac{1.92 \text{ V}}{6} = \sqrt{0.32 \text{ A}}$

g) Ω