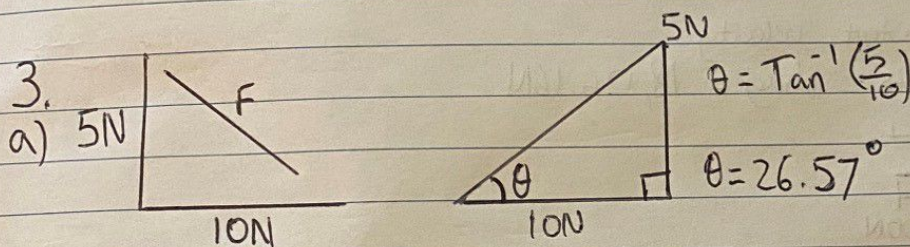


Joshua Thomas
211 5652

1.
 - a) M^2
 - b) M^3
 - c) ~~kg~~ kg
 - d) N
 - e) N

2. Density = $\frac{\text{Mass}}{\text{Volume}} = \frac{\text{Kg}}{\text{m}^3} = \text{Kg/m}^3$



$$\Sigma F^2 = 5^2 + 10^2$$

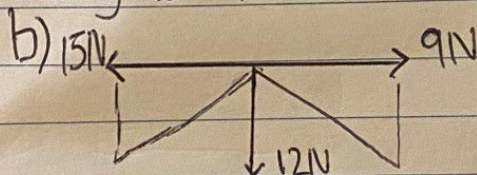
$$\Sigma F^2 = 125$$

$$F = \sqrt{125}$$

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

Resultant is 11.18 N to the right
26.57° above the horizontal

Bearing is $90 - 26.57 = 63.43^\circ$



~~Resultant = 15 + 9 = 6N~~ $-6^2 + 12^2 = 108$

~~Resultant is 6N to the left.~~ $\Sigma F^2 = 108$

$$F = \sqrt{108}$$

$$F = 10.39 \text{ N}$$

Resultant is 10.39 N to the ~~right~~ left.

$$\tan \theta = \frac{-6}{10.39}$$

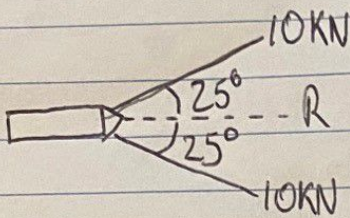
$$\theta = \tan^{-1}(-6/10.39)$$

$$\theta = -30^\circ$$

Bearing is $90 + -30 = 60^\circ$

Joshua Thomas
2115652

4.



$$a) \cos 25 = \frac{R}{10,000}$$

$$10,000 \times \cos 25 = 9063.08N \quad R = 9063.08N$$

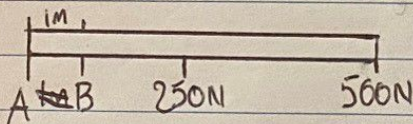
$$\text{For both tug boats} = 2 \times 9063.08N = 18,126.16N$$

b) boat moves with constant velocity

$$\text{Resultant of two boats} = \text{drag} = 18,126.16N$$

5m

5.



a) take moments about B

$$CWM = A CWM$$

$$(250 \times 1) + (500 \times 4) = (A \times 1)$$

$$A = 2250N$$

b) Take moments about A

$$CWM = A CWM$$

$$(250 \times 1) + (500 \times 5) = B \times 1$$

$$\cancel{B = 3125N} \quad B = 3000N$$

$$3000 = 2250 + 250 + 500$$

Forces up = Forces down

ACHA3000

Joshua Thomas
2115652

Page 3 of 3

6.

a) Positive to negative

b) 0.33Ω

c)