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211 5652

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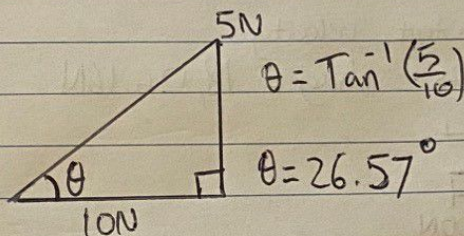
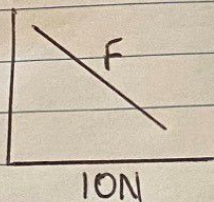
1.

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

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

3.

a) 5N



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

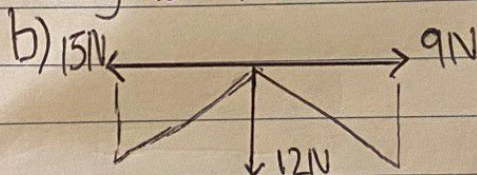
$$\Sigma F^2 = 125$$

$$F = \sqrt{125}$$

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

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

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



$$\Sigma F^2 =$$

$$\text{Resultant} = 15 + 9 = 6 \text{ N} \quad 6^2 + 12^2 = 108$$

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

$$F = \sqrt{108}$$

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

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

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

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

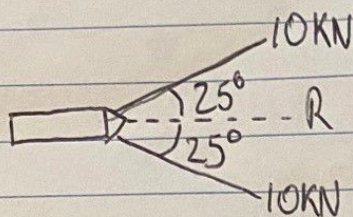
$$\theta = -30^\circ$$

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

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4.



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

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

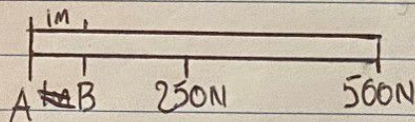
$$\text{For both tug boats} = 2 \times 9063.08 \text{ N} = 18,126.16 \text{ N}$$

b) boat moves with constant velocity

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

5m

5.



a) take moments about B

$$CWM = A CWM$$

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

$$A = 2250 \text{ N}$$

b) Take moments about A

$$CWM = A CWM$$

$$(250 \times 2) + (500 \times 5) = B \times 1$$

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

$$3000 = 2250 + 250 + 500$$

$$\text{Forces up} = \text{Forces down}$$

ACHA3000

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6.

a) Positive to negative

b) 0.33Ω

c)