

Alexander Miles

14/01/22

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(ACHA3000)

Foundation Physics

a m^2

b m^3

c kg

d N

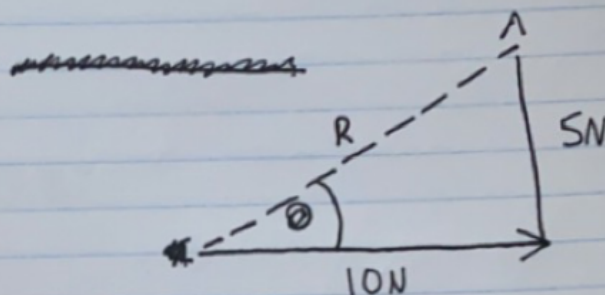
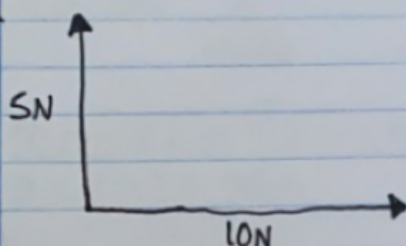
e N

2 Density = $\frac{\text{mass}}{\text{Volume}}$

kg
 m^3

Density = kg/m^3

3a



$$5^2 + 10^2 = 125$$

The third force 11.18N is
 26.56° above the horizontal

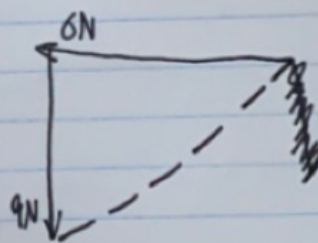
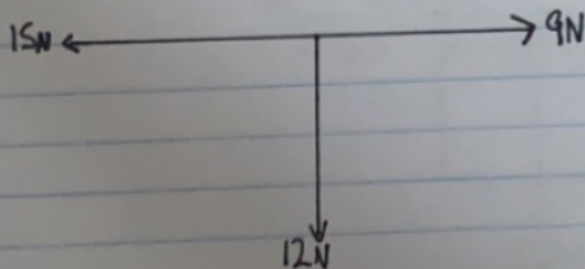
$$\theta = \tan^{-1}\left(\frac{5}{10}\right) = 26.56^\circ$$

$$\sqrt{125} = 11.18 \text{ N}$$

$$\text{bearing} = 90 + 26.56 = 116.56^\circ$$

11.18 N to the right.

b



$$\theta = 6^2 + 9^2 = 117$$

$$\sqrt{117} = 10.82 \text{ N}$$

the third force 10.82N is
to the left 56.30° below the
horizontal

$$\tan \theta = \text{opposite} / \text{adjacent}$$

$$\tan^{-1} \frac{9}{6} = 56.30$$

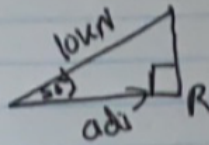
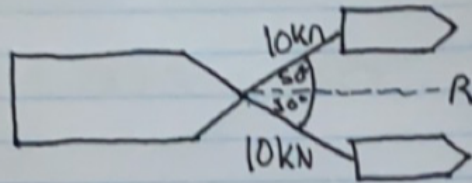
$$\text{bearing} = 90 + 56.30 = 146.3$$

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4a



$$\cos 50 \frac{\text{adi}}{\text{hyp}}$$

$$\cos 50 \frac{R}{10,000}$$

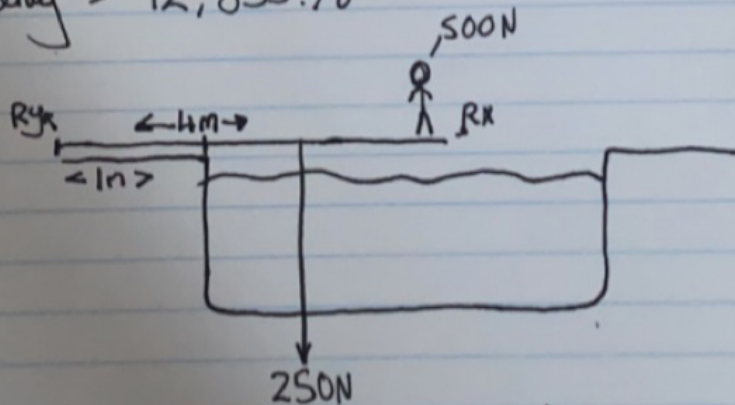
$$10,000 \times \cos 50 = 6427.87$$

$$R = 6427.88 \text{ N}$$

$$\text{Therefore 2 tugboats } 2 \times 6427.88 = 12855.76$$

- b) Boat moves with constant velocity therefore resultant of both boats $\star = \text{drag} = 12,855.76$

So



clockwise moments = anti clockwise moments

$$R_y \times 4 = 250 \times 2$$

$$R_y = \frac{250 \times 2}{4}$$

$$R_y = 125 \text{ N}$$

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6a A Positive

b $0.5 + 2 + 6 + 3 = 11.5 \Omega$

c