

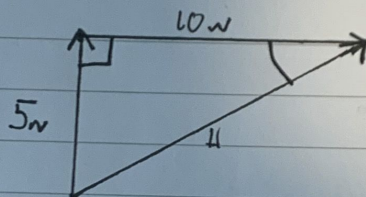
Online exam Science and Maths ACHA 3001

Answer 1)

- A. Area = m^2
- B. Volume = m^3
- C. Mass = kg
- D. Force = N
- E. weight = N

2) Density = $\frac{\text{Mass}}{\text{Volume}} = \frac{kg}{m^3} = \boxed{kg/m^3}$

3) A) $A^2 = B^2 + C^2$ $A = \sqrt{5^2 + 10^2} = \cancel{11.18} \quad 5\sqrt{5} \quad N$



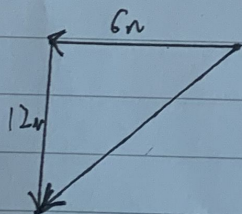
$$\tan \theta = \frac{5}{10}$$

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

$$\boxed{\theta = 26.57^\circ (2dp)}$$

Resultant is 11.18 N to the left R-right angle 26.57° below the horizontal

B $15 - 9 = 6$



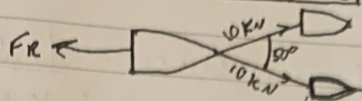
$$A^2 = B^2 + C^2 \quad A = \sqrt{12^2 + 6^2} = 13.42$$

$$\tan \theta = \frac{6}{12}$$

$$26.57^\circ$$

$$\tan^{-1} \frac{6}{12}$$

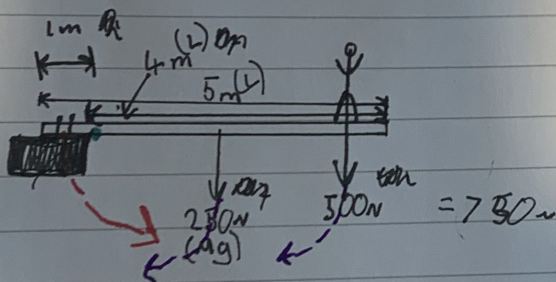
6) A ship is towed at a constant speed by 2 boats 10 kN each



a) $2 \times 10000 \cos 25 = 18126.16 \text{ N}$

b) constant speed $RF = \text{Drag}$ therefore 18126.16 N

5) $(W_0 \times D_0) + (W_1 \times D_1) = (250 \times 1) + (500 \times 4) = \underline{2250 \text{ N}}$



$P = 1 \text{ m}$

$W_1 = 250$

$D_1 = 1 \text{ m}$

$D_2 = 4 \text{ m}$

$W_2 = 750$

a) $CW M = ACWM \quad W_1 D_1 = W_2 D_2$

~~$750 \times 1 = 250 \times 4$~~

~~$750 \times 1 = 250 = 187.5 \text{ N}$~~

$CW M = ACWM$

~~$4 \times 750 = 250 \times 1$~~

~~$4 \times 750 = 250 = 3000 \text{ N}$~~

b) 4750

14.1.22

6)

a. A. Positive to Negative

b. $R_T = R_1 + R_2 + R_3 + R_4$

Total resistance = 11.5Ω

c. $V = IR$ $V = 12 \text{ V}$
 $R = 11.5 \Omega$
~~current~~

0.4 ms low

~~1.043~~

$$\text{Current} = \frac{\text{Voltage}}{\text{Resistance}} = \underline{1.043}$$

D. $V = IR$ $V = 12 \text{ V}$ $1.04 \times 11.5 = \underline{11.96}$

E. $I = \frac{V}{R} =$

$V = IR = 1.04 \times 0.5 = 0.52 \text{ V}$

$$\frac{0.52}{2} = \underline{0.26 \text{ A}}$$

F. $I = \frac{V}{R} = \frac{0.52}{6} = \underline{0.09 \text{ A}}$

G.