

Morphy 3250P - Browne

14/05/2021

Science Exam

1.

- a) Area = m^2
- b) Volume = m^3
- c) Mass = kg
- d) Force = N
- e) Weight = N

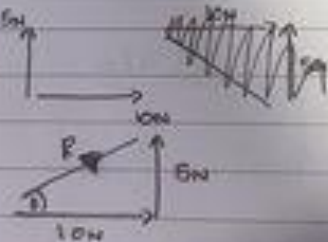
2.

- a) Density = $\frac{\text{Mass}}{\text{Volume}}$ Density = $\frac{kg}{m^3}$

Density = kg/m^3

3.

a)



$$R^2 = 10^2 + 5^2$$

$$R^2 = 125$$

$$R = \sqrt{125}$$

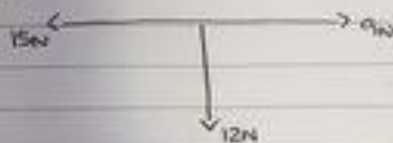
$$R = 11.18N$$

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

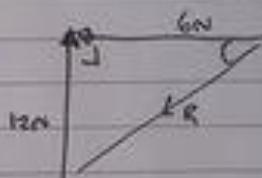
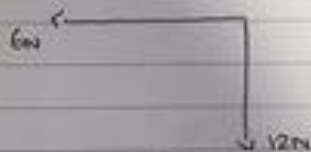
$$\theta = 26.57^\circ \quad (\text{Resultant is } 11.18N \text{ to the right, } 26.57^\circ \text{ above horizontal})$$

$$\text{Bearing} = 90 - 26.57 = \underline{63.43^\circ}$$

b)



$$-15 + 9 = -6$$



$$R^2 = 6^2 + 12^2$$

$$R^2 = 180$$

$$R = \sqrt{180}$$

$$\underline{R = 13.42\text{ N}}$$

$$\tan \theta = \frac{12}{6} \quad \theta = \tan^{-1}\left(\frac{12}{6}\right)$$

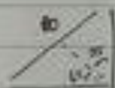
$$\underline{\theta = 63.43^\circ}$$

(Resultant is 13.42 N to the left
63.43° below the horizontal)

$$\text{Bearing} = 270 - 63.43$$

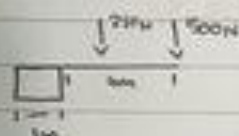
$$= \underline{206.57^\circ}$$

4.



5.

a)



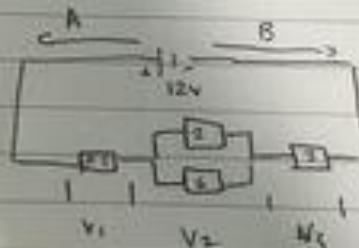
$$250 \times 1 + 500 \times 4$$

$$= 2250 \text{ N}$$

b) $250 \times 2 + 500 \times 5 = 3000 \text{ N}$

6.

$$V = IR$$



a) $\hat{A}$

$$0.5 + 8 + 3 = 11.5 \Omega$$

b) $\frac{12 \text{ V}}{11.5 \Omega} = 1.04 \text{ A}$ c) $12 \times 1.04 = 12.48 \text{ W}$

d) $1.04 \times 8.5 = 8.84 \text{ V}$

e) $\frac{12}{2.5} = 4.8$ $4.8 \times 12 = 57.6 \text{ W}$

f) $\frac{12}{6.5} = 1.8$ $1.8 \times 12 = 21.6 \text{ W}$ g) R_2