

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 =  $N$

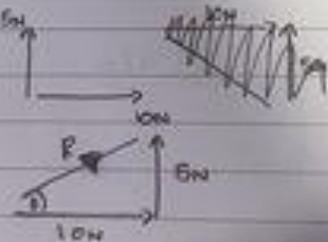
2.

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

Density =  $kg/m^3$

3.

a)



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

$$R^2 = 125$$

$$R = \sqrt{125}$$

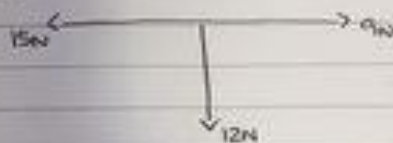
$$R = 11.18N$$

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

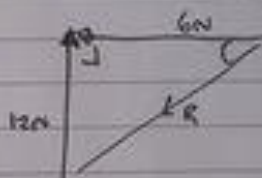
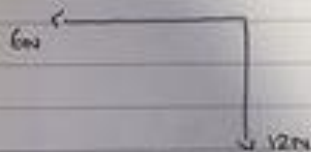
$$\theta = 26.57^\circ \quad (\text{Resultant is } 11.18N \text{ to the right, } 26.57^\circ \text{ above horizontal})$$

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

b)



$$-15 + 9 = -6$$



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

$$R^2 = 180$$

$$R = \sqrt{180}$$

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

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

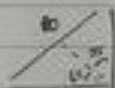
$$\underline{\theta = 63.43^\circ}$$

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

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

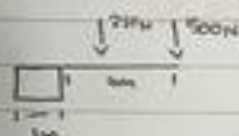
$$= \underline{206.57^\circ}$$

4.



5.

a)



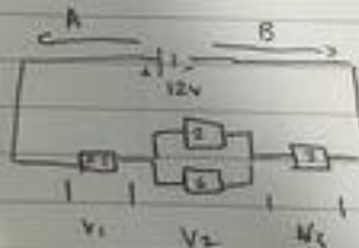
$$250 \times 1 + 500 \times 4$$

$$= 2250 \text{ N}$$

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)  $1.04 \times 8 = 8.32 \text{ W}$

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)  $R_2$