

Intro to Maths and Science

ACHA3000

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Question 1

A. Displacement = m

B.

B. Distance = ~~metres~~ m cm

C. Speed = $\frac{\text{Distance}}{\text{Time}} = m/s$ metre ^{per} Second

D. Velocity = ms^{-1} or m/s

E. Acceleration = m/s^2 metre per Second squared

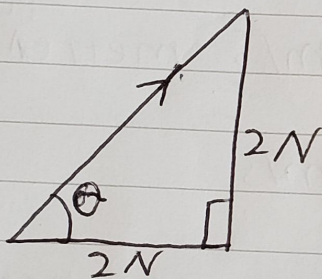
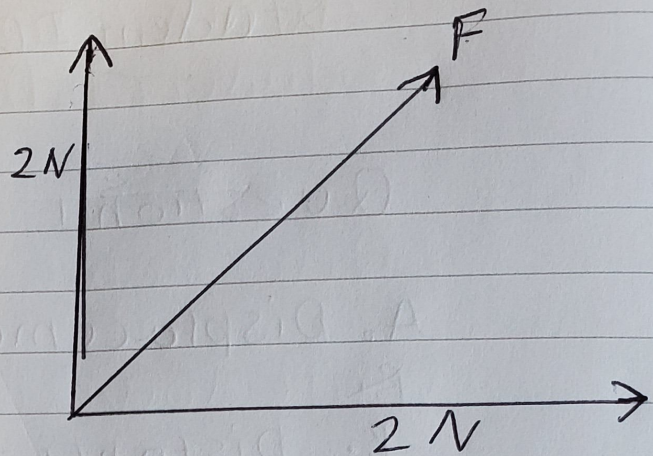
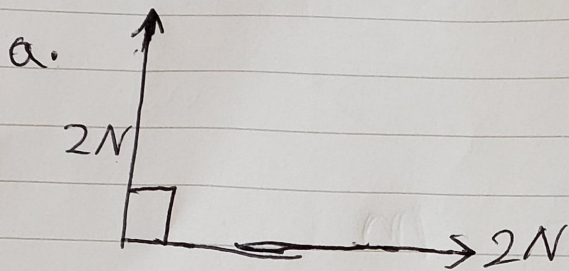
(2 marks)

2. Torque = Force $\times$ Radius

Write down the units of torque

Torque = Nm = Newton $\times$ Metre

Question 3



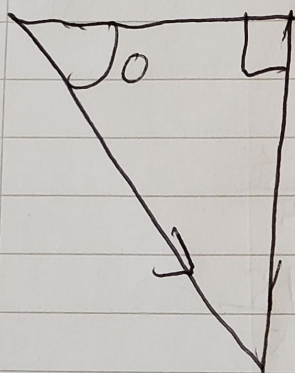
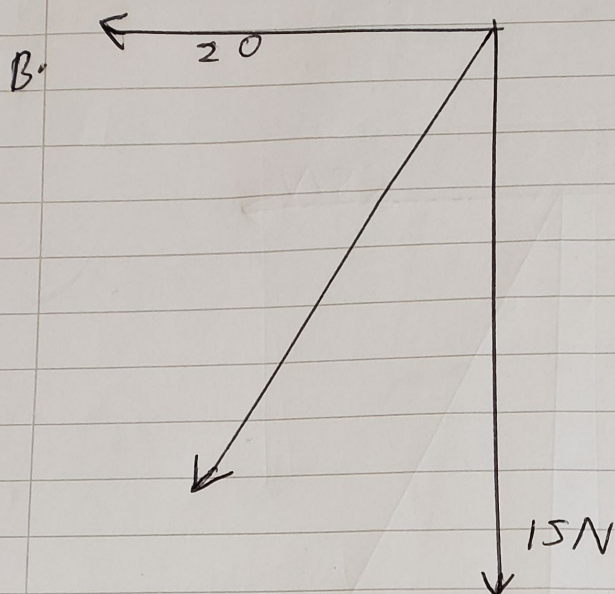
$$F = 2 + 2^2$$

$$F =$$

$$F =$$

$$\begin{aligned} \tan \theta &= \frac{2}{2} \\ \theta \tan &= \frac{2}{2} \\ \theta &= 1 \end{aligned}$$

The resultant is 1 N
to the right above
the horizontal
Bearing is 1



$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan \theta = \frac{20}{15}$$

$$\theta = \tan^{-1} \frac{20}{15}$$

$$\theta = 33.3^\circ$$

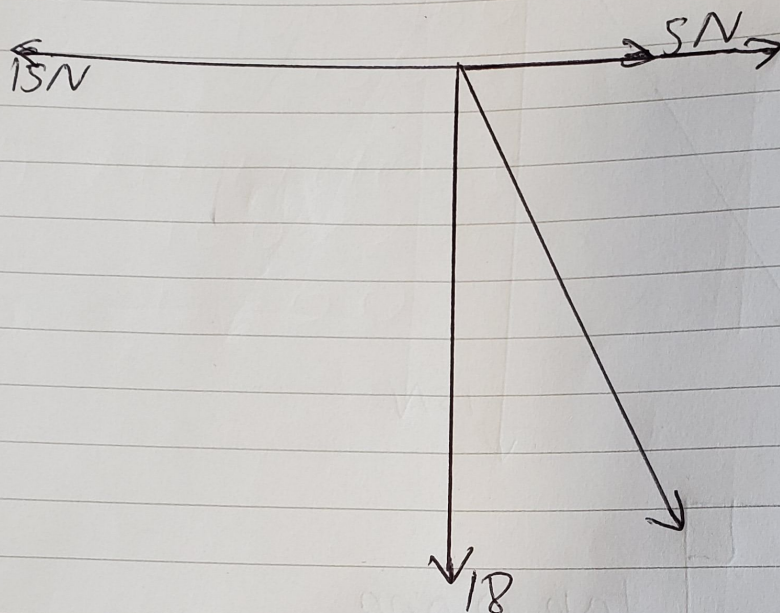
Resultant
is 15N to
the right
Bearing

$$90.50 + 33.3 = 123.8$$

$$\text{ans} = 1.33$$

x

C.



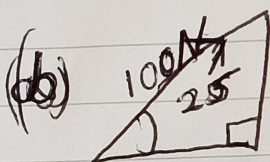
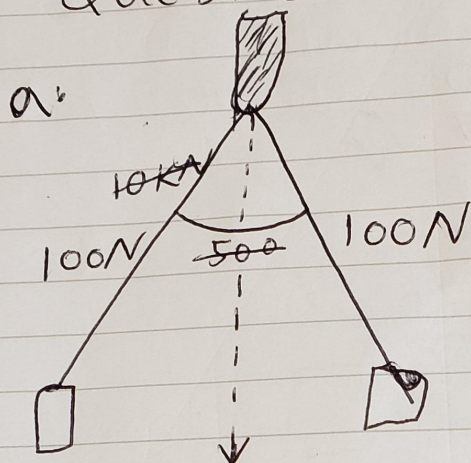
$$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{15}{5}$$

$$\tan \theta = \frac{15}{5}$$

$$= \frac{15}{5}$$

$$\text{ans} = 83.3^\circ$$

Question 4



$$\cos 25 = \frac{\text{Base string}}{\text{Hyp}}$$

$$\cos 25 = \frac{B}{100}$$

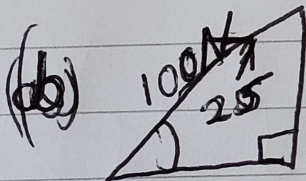
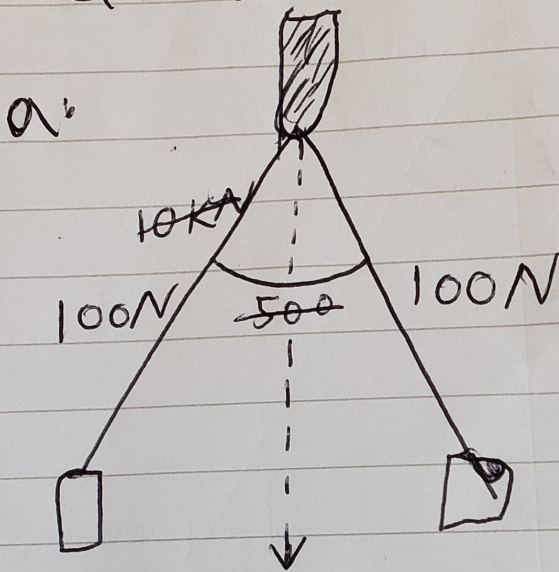
$$100 \times \cos 25 = B$$

$$B = 92,705$$

$$\text{ans} = 92,705$$

Nxt page

Question 4



$$\cos 25 = \frac{\text{Bowstring}}{\text{Hyp}}$$

$$\cos 25 = \underline{B}$$

$$1000 \times 25$$

$$B = 25,000$$

$$\text{ans} = 25,000$$

question 4
(c)

The force is

$$100 \times 160$$

$$= 16000$$

(ii) After release

$$100 \times 2$$

$$\text{ans} = 200$$

5: Question 5



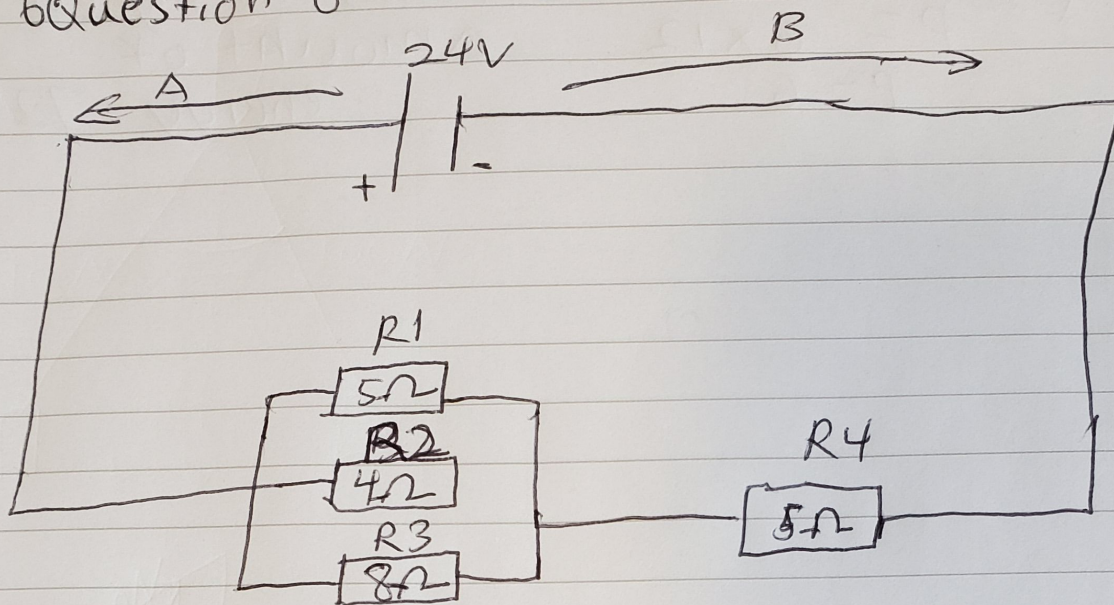
$$65N + 10N = 650N$$

$$F = M \times A$$

$$F = 650N \times 9.81$$

$$F = 6376.5N$$

Question 6



(a) The conventional current flow in 'A' is positive 'B' is negative

$$(b) R1 + \frac{1}{\frac{1}{R2} + \frac{1}{R3}} + R4$$

$$R = 0.5\Omega + \frac{1}{\frac{1}{4\Omega} + \frac{1}{8\Omega}} + 3\Omega$$

$$R = 0.5 + 1.5\Omega + 3\Omega$$

$$R = 5\Omega$$

$$(c) V = I \times R$$

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

$$I = \frac{12V}{5\Omega}$$

$$I = 2.4 \text{ Amps}$$

$$(d) V = I R$$

$$V = 2.4 \times 3\Omega$$

$$V = 7.2V$$

(9) $P = I \times V$
 $P = 6 \times 12$
 $P = 72$

R3 has the highest
amount of
energy = 72W