

Intro to Science Exam

①

1)

a) m^2 b) m^3

c) kilograms (kg)

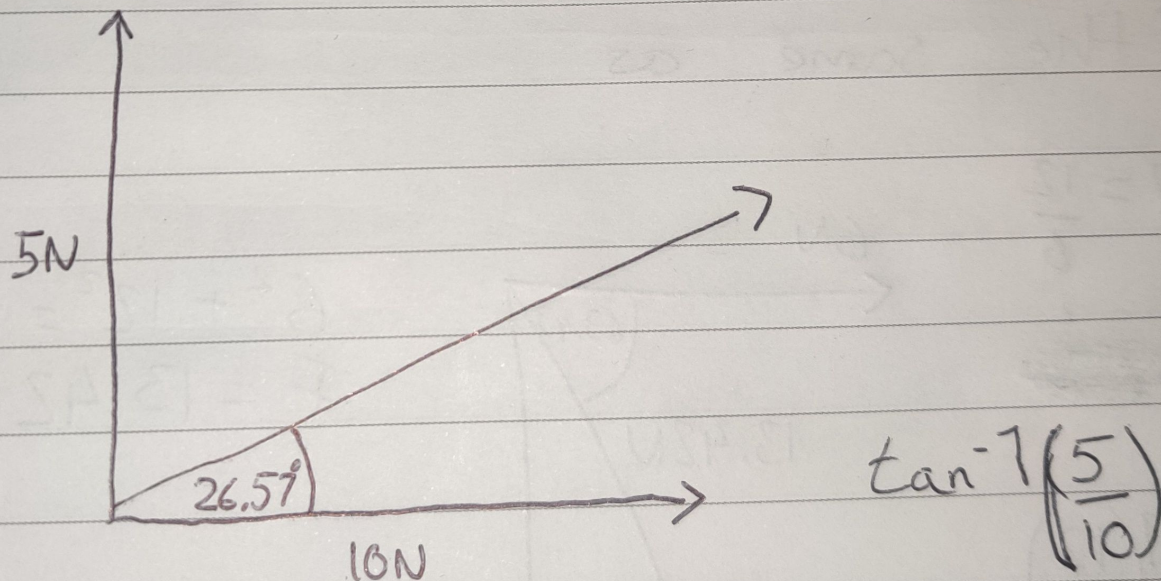
d) Newtons (N)

e) Newtons (N)

2) kilograms per cubic meter (kg/m^3)

3)

a)



$$5^2 + 10^2 = F^2 \quad \tan \theta = \frac{5}{10}$$

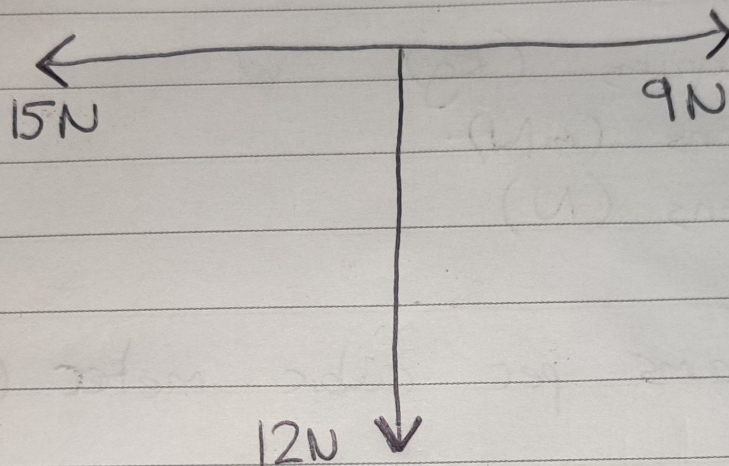
$$F = 11.18 \text{ N}$$

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

(2)

Resultant is 11.18N to the right,
26.57° above the horizontal.

b)



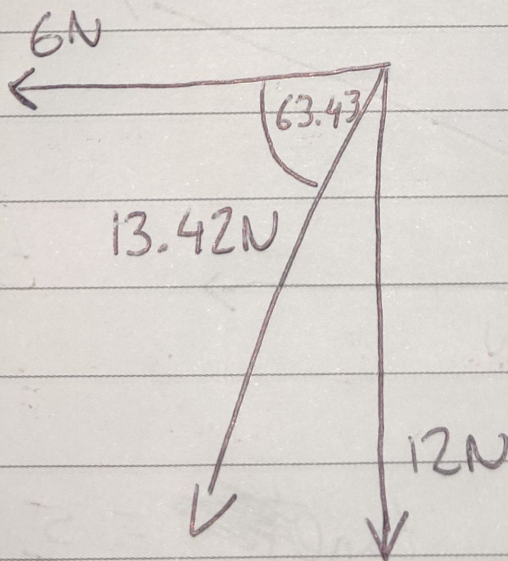
is the same as

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

~~scribble~~

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

$$= 63.43$$



$$6^2 + 12^2 = F^2$$

$$F = 13.42 \text{ N}$$

$$180 + (90 - 63.43) = 206.57$$

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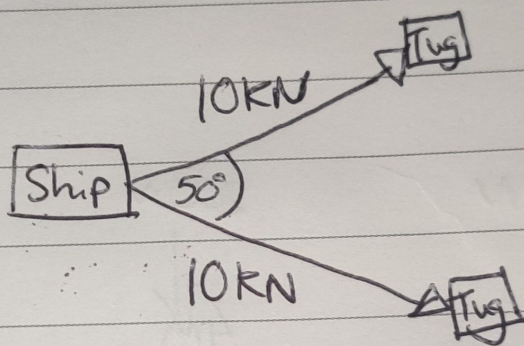
③

Resultant is 13.42N to the left and
 63.43° below the horizontal.

bearing = 206.57°

4)

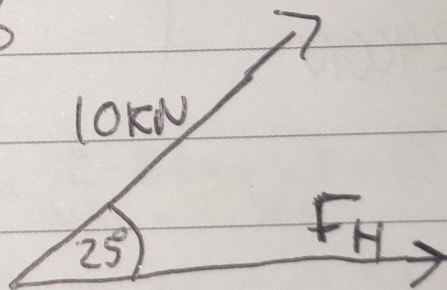
a)



$$F_H = 10000 \cos 25$$

$$F_H = 9063.08$$

$$9063.08 \times 2 = 18126.16$$



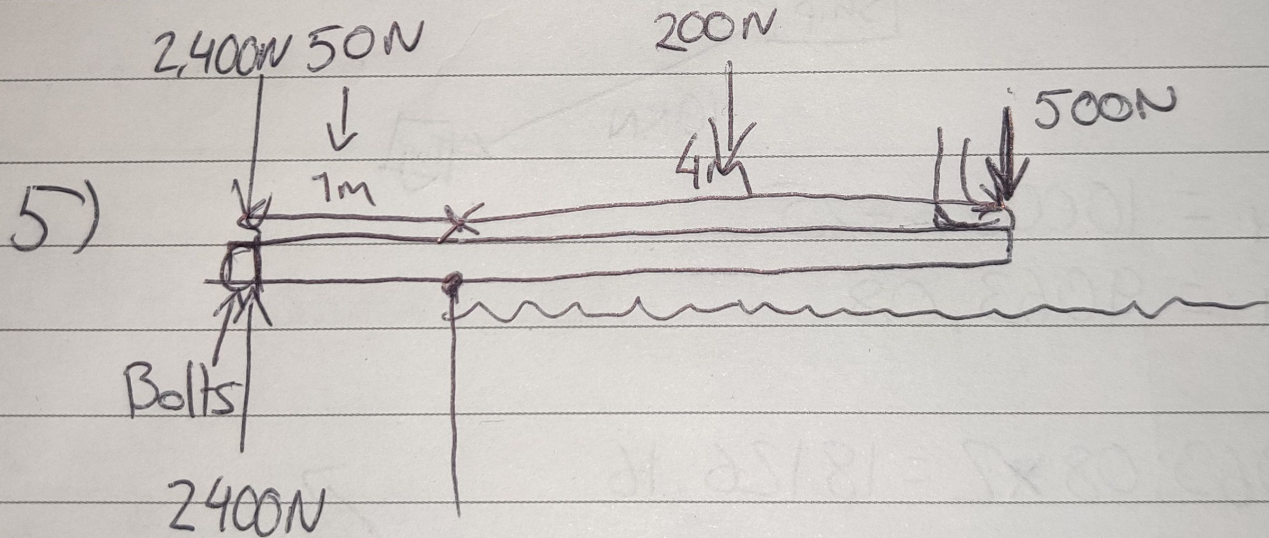
b)

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④



6)

a) A positive to B negative

$$b) (\cancel{1000} 0.5 + 3) + \left(\frac{1}{2} + \frac{1}{6}\right) = 4.167 \Omega$$

$$c) \frac{12}{4.167} = 2.88 A$$

$$d) 3 \times 2.88 = 8.64 V$$

$$* e) \cancel{0.5 \times 2.88 = 1.44 V} \quad \begin{array}{l} 12 - 8.64 + V_3 = 0 \\ V_3 = -3.36 V \end{array} \quad \frac{3.36}{2} = 1.68$$

$$* f) \left(\frac{1}{6}\right) \times 2.88 = \cancel{0.48 V} \quad \frac{3.36}{6} = 0.56 A$$

g) R_4 transfers the most energy

$$(R_4 = 2.88^2 \times 3 = 24.8832)$$

$$e) 1.68 A$$

$$f) 0.56 A$$