

- 1 (a) Explain the differences between the quantities *distance* and *displacement*.

.....

 [2]

- (b) State Newton's first law.

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 [1]

- (c) Two tugs pull a tanker at constant velocity in the direction XY, as represented in Fig. 1.1.

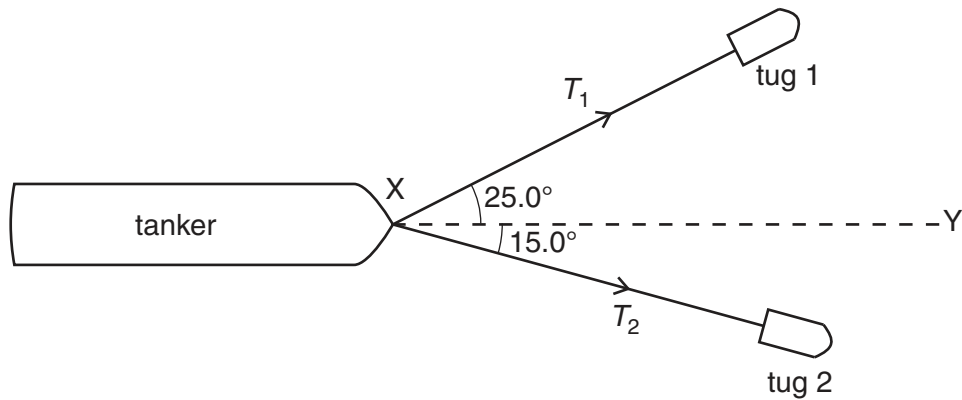


Fig. 1.1

Tug 1 pulls the tanker with a force T_1 at 25.0° to XY. Tug 2 pulls the tanker with a force of T_2 at 15.0° to XY. The resultant force R due to the two tugs is $25.0 \times 10^3 \text{ N}$ in the direction XY.

- (i) By reference to the forces acting on the tanker, explain how the tanker may be described as being in equilibrium.

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 [2]

- (ii) 1. Complete Fig. 1.2 to draw a vector triangle for the forces R , T_1 and T_2 . [2]

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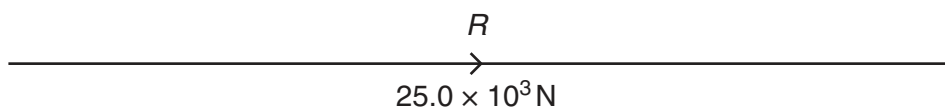


Fig. 1.2

2. Use your vector triangle in Fig. 1.2 to determine the magnitude of T_1 and of T_2 .

$$T_1 = \dots\dots\dots \text{ N}$$

$$T_2 = \dots\dots\dots \text{ N}$$

[2]