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Online tutoring for Cambridge IGCSE, O Level & A Level Physics

IGCSE PHYSICS 0625 · TOPICAL PAST PAPERS

Physical Quantities & Measurement

Paper 2 — Theory Worksheet (topical compilation)

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The City School

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PAF CHAPTER

PHYSICAL QUANTITIES, UNITS AND MEASUREMENTS P2

Question # 1: May June 2010/P22/Q1

A journey consists of two displacements: the first is 500m in a northerly direction and the second is 200m in an easterly direction.

(a) In the space below draw, to scale, a vector diagram of these displacements.

State the scale of your diagram.

On your diagram, show the two displacements and the resultant displacement.

Determine the size (magnitude) and direction of the resultant displacement.



scale =

size =

direction =

[3]

Question # 2: May June 2014/P21/Q1

- (b) The boat travels from the area of still water into an area where the velocity of the water is 2.0 m/s towards the north-east, as shown in Fig. 1.1.

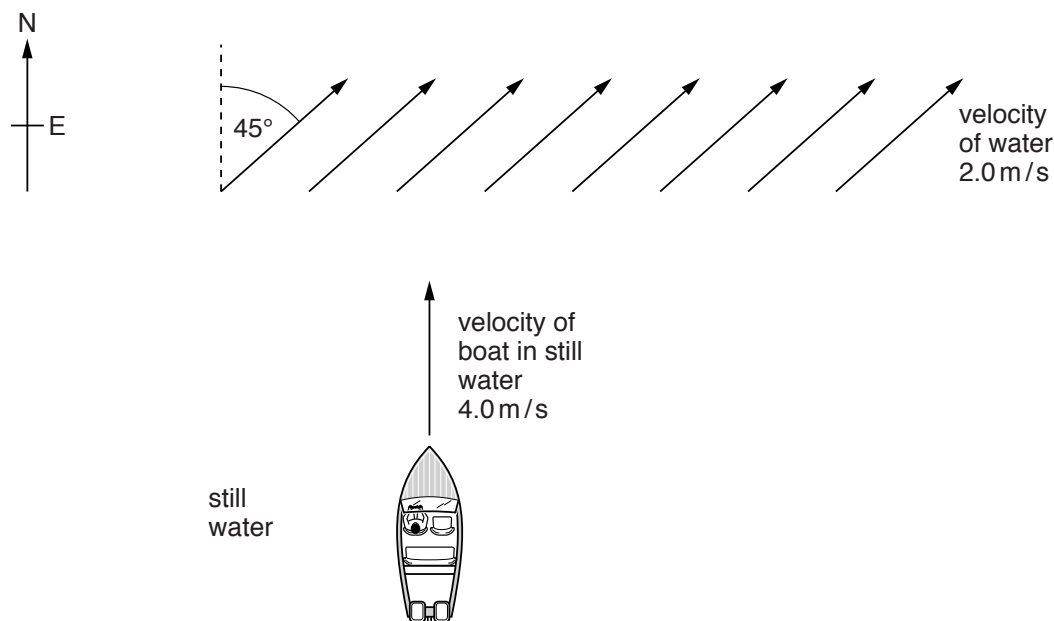


Fig. 1.1 (not to scale)

Combining the initial velocity of the boat with the velocity of the water gives the resultant velocity of the boat.

In the space on the page opposite, draw a vector diagram to show the resultant velocity.

Use your diagram to find the size and direction of the resultant velocity.

size of resultant velocity =

direction of resultant velocity =

[4]

Question # 3: Oct Nov 2008/P2/Q1

A microphone has a weight W of 6.0 N. It is suspended by wire X from the ceiling in a radio studio.

Fig. 1.1 shows the microphone held in the correct position by a horizontal wire Y.

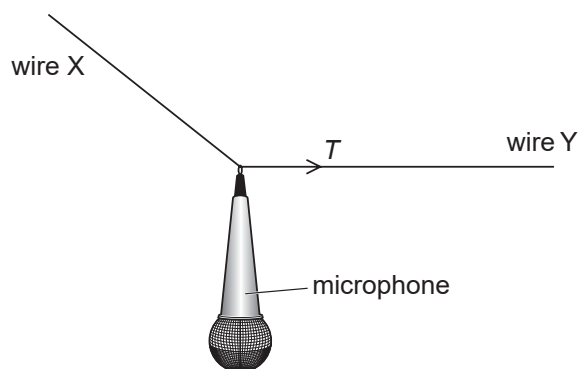


Fig. 1.1

- (a) The tension T in wire Y is 8.0 N. Use a vector diagram to determine the magnitude and the direction of the resultant of W and T .

magnitude =

direction =

[4]

Question # 4: Oct Nov 2012/P21/Q1

A parachutist of total weight 950 N falls vertically at a constant velocity of 6.5 m/s.

- (b) At a certain height, the wind starts to blow and the parachutist moves horizontally at a velocity of 4.5 m/s as he continues to fall.

Use a graphical method to add together the horizontal and the vertical velocities to determine the size of the resultant velocity of the parachutist. Label the velocities and state the scale that you use.

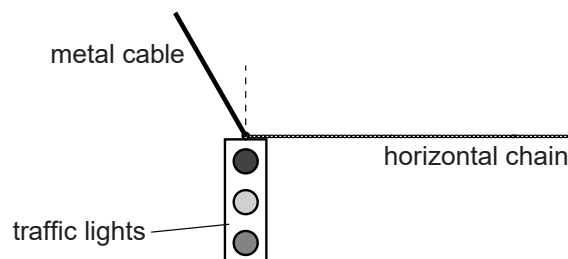
size of velocity =

scale =

[3]

Question # 5: Oct Nov 2013/P22/Q1

A set of traffic lights hangs from the end of a metal cable. A horizontal chain pulls the traffic lights to the right so that they are above the middle of the road. Fig. 1.1 shows the metal cable inclined to the vertical.

**Fig. 1.1**

The weight of the traffic lights is 240 N.

- (a) Two of the forces on the traffic lights are the tension in the horizontal chain and the weight of the traffic lights.

On Fig. 1.1, mark

- (i) an arrow that represents the tension in the horizontal chain, [1]
 - (ii) an arrow that represents the weight of the traffic lights. [1]
- (b) The tension in the horizontal chain is 140 N. Use a scale diagram to determine the size of the resultant of the weight and the tension in the chain. State the scale used for the diagram.

scale =

resultant force =

[3]

Question # 6: Oct Nov 2017/P22/Q1

Two small tugboats are pulling a large ship in a harbour. Fig. 1.1 represents the view from above and shows the directions of the forces on the ship.

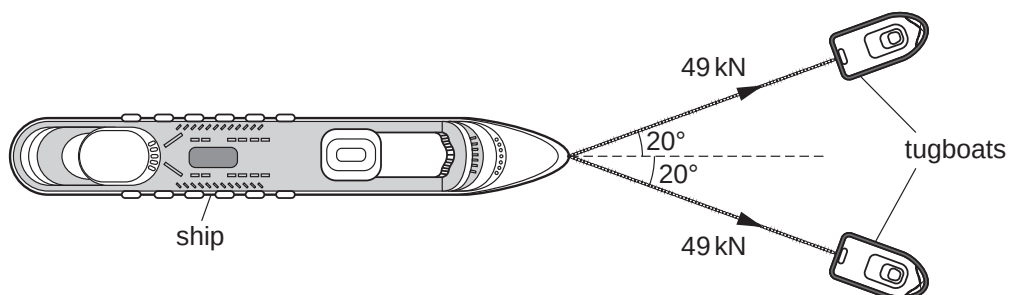


Fig. 1.1 (not to scale)

Each of the tugboats is exerting a force of 49 kN on the ship.

(a) Determine by a graphical method the resultant of these two forces and state the scale used.

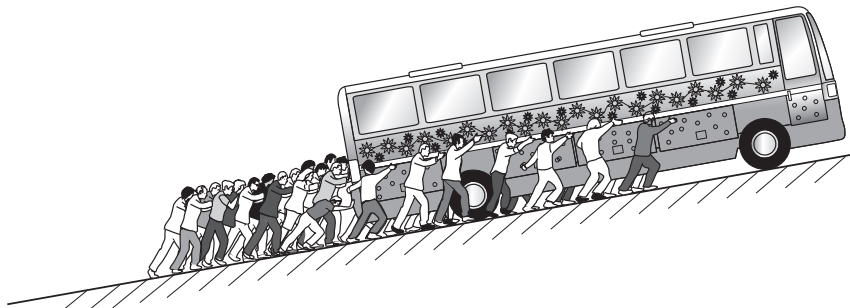
scale

resultant =

[3]

Question # 7: Oct Nov 2010/P22/Q10

A bus breaks down on a road with a 10° upward slope. The passengers get out and push the bus to the top of the slope at a constant speed. Fig. 10.1 shows the passengers exerting a force on the bus parallel to the line of the slope.

**Fig. 10.1**

- (a) The total weight of the bus is 32000 N.
- (ii) On Fig. 10.1, draw **two** arrows to show the direction of the weight of the bus and the direction of the force exerted on the bus by the passengers. [1]
- (iii) The total force exerted by the passengers on the bus is 17000 N along the line of the slope. Use a graphical method to determine the size and direction of the resultant of this force and the weight of the bus. State the scale used.

scale =

size of resultant =

direction of resultant =

[4]

Question # 8: Oct Nov 2015/P21/Q9

Force is a vector quantity and mass is a scalar quantity.

- (a) (i)** State how a vector quantity differs from a scalar quantity.

.....
..... [1]

- (ii)** State one other vector quantity and one other scalar quantity.

vector quantity
scalar quantity [2]

- (b)** An aeroplane flies through the air in a straight line, with its engines at full power. The weight of the aeroplane is 160 kN. There is also a force of 320 kN acting upwards on the aeroplane at 30° to the horizontal.

In the space below, use a graphical method to determine the size and the direction of the resultant of these two forces. Use a scale of 1.0 cm : 40 kN.

size of resultant force =

direction of resultant force = [4]