

Name of the Student: _____

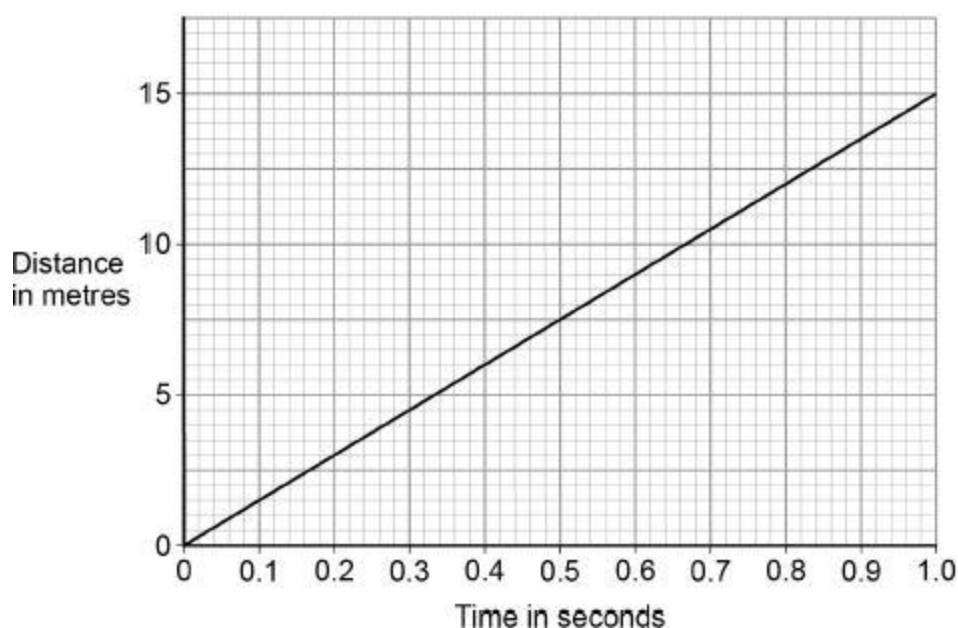
Max. Marks : 23 Marks

Time : 23 Minutes

Q1.

- (a) Figure 1 shows the distance-time graph for a car travelling at 15 m/s

Figure 1



When the driver is tired, his reaction time increases from 0.50 seconds to 0.82 seconds.

Determine the **extra** distance the car would travel before the driver starts braking.

Distance = _____ m

(2)

- (b) When the brakes are used, the temperature of the brakes increases.

Explain why. Use ideas about energy in your explanation.

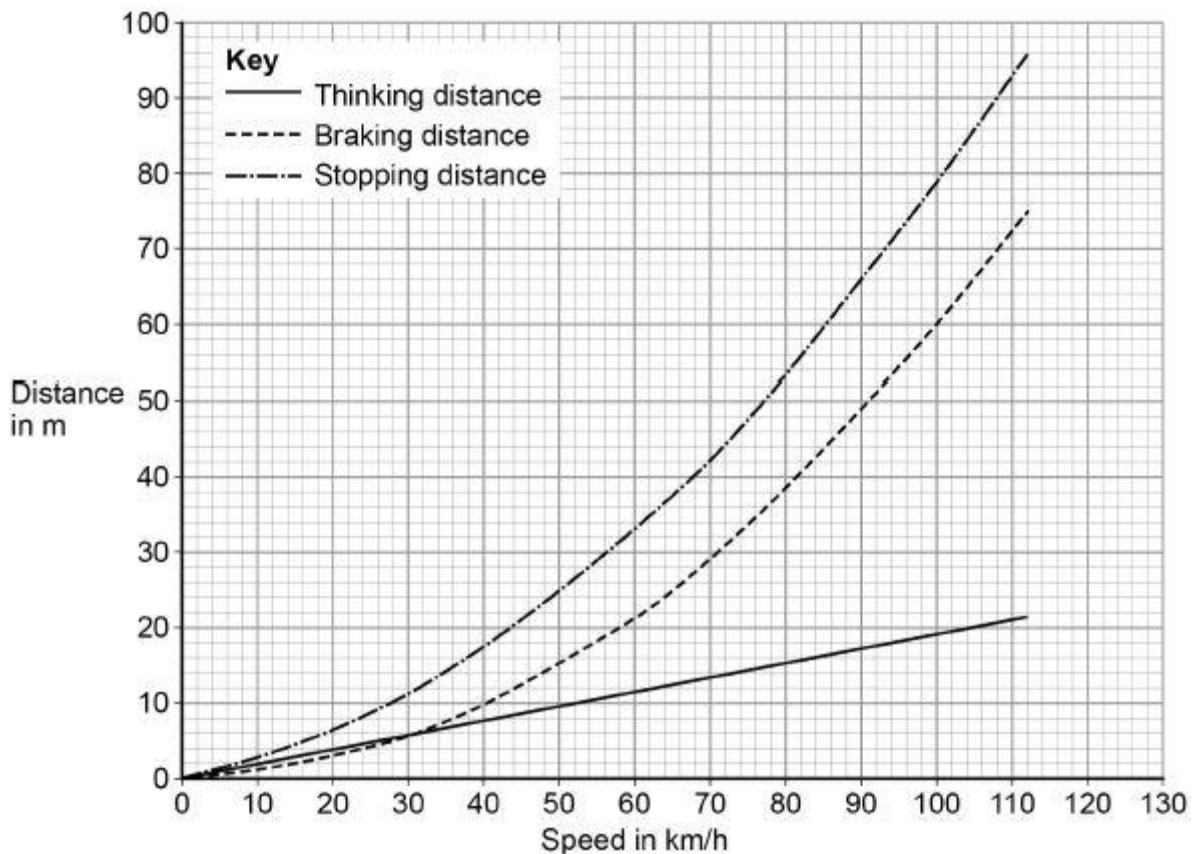
- (c) A lorry travels 84 m with a constant acceleration of 2.0 m/s^2 to reach a velocity of 19 m/s .
Calculate the initial velocity of the lorry.

Use the Physics Equations Sheet.

Initial velocity = _____ m/s

- (d) **Figure 2** shows how the thinking distance, braking distance and stopping distance for a car vary with the speed of the car.

Figure 2



Describe the relationships shown in **Figure 2**

You should include factors that would affect the gradient of the lines.

(6)
(Total 13 marks)

Q2.

Figure 1 shows the horizontal forces acting on a man swimming in the sea.

Figure 1



- (a) Describe the movement of the man when the resultant horizontal force is 0 N

(1)

- (b) The man increases Force **A**.

Explain what happens to Force **B** and to the movement of the man.

- (c) A boat moves through the sea.

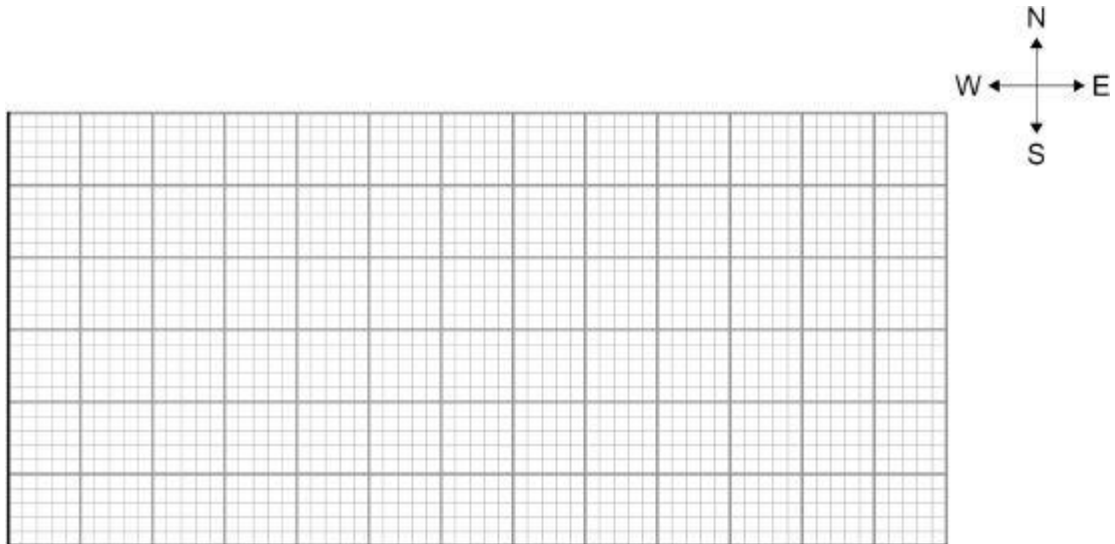
There is a 3000 N force to the west on the boat.

There is a 1000 N force to the south on the boat.

Determine the magnitude and direction of the resultant force on the boat.

Draw a vector diagram of these forces to scale on **Figure 2**

Figure 2



Magnitude of resultant force = _____ N

Direction of resultant force = _____ °

(3)

- (d) The force to the south on the boat increases.

What effect does this have on the resultant force on the boat?

(2)

(Total 10 marks)