

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

An investigation was carried out to show how thinking distance, braking distance and stopping distance are affected by the speed of a car.

The results are shown in the table.

Speed in metres per second	Thinking distance in metres	Braking distance in metres	Stopping distance in metres
10	6	6	12
15	9	14	43
20	12	24	36
25	15	38	53
30	18	55	73

- (a) Draw a ring around the correct answer to complete each sentence.

As speed increases, thinking distance

decreases.
 increases.
 stays the same.

As speed increases, braking distance

decreases.
 increases.
 stays the same.

(2)

- (b) One of the values of stopping distance is incorrect.

Draw a ring around the incorrect value in the table.

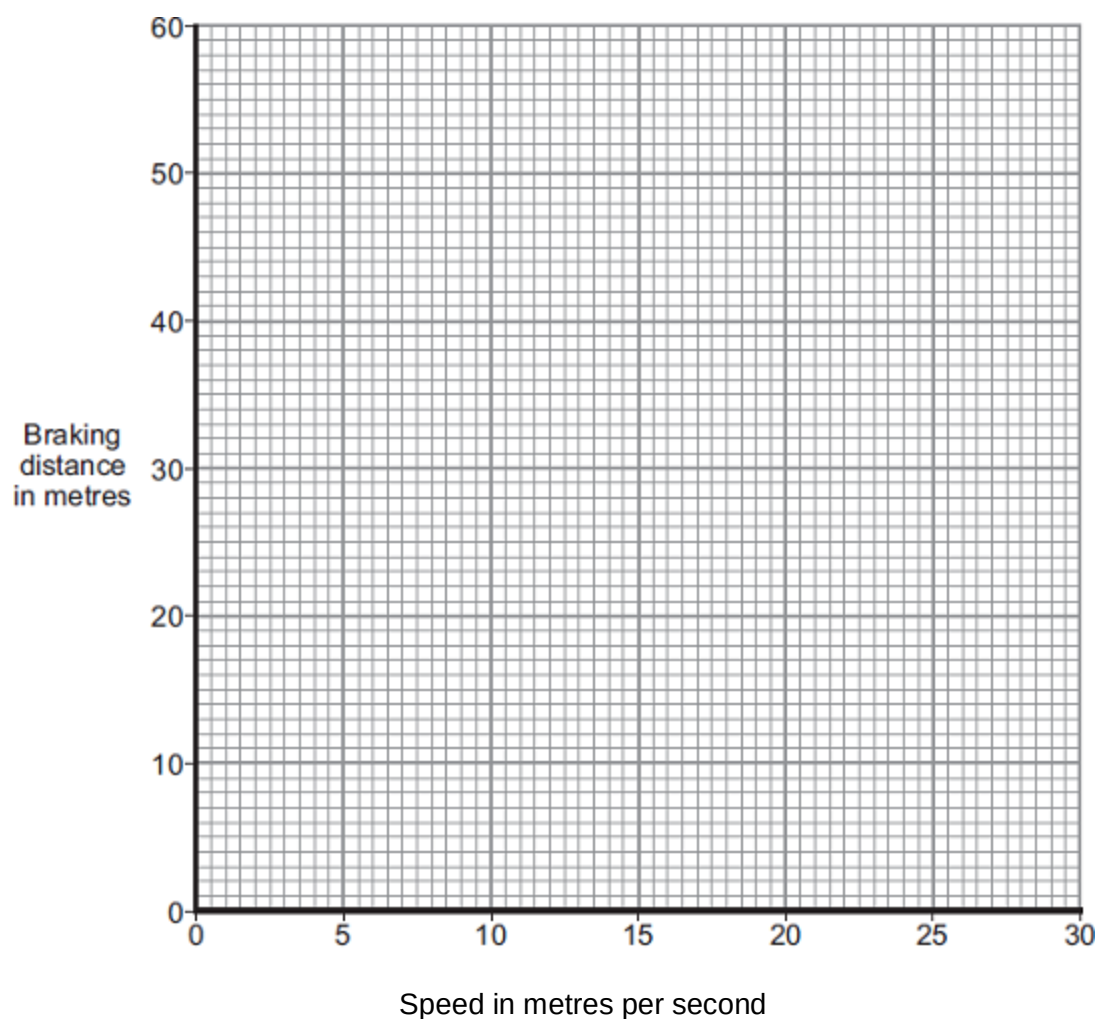
Calculate the correct value of this stopping distance.

Stopping distance = _____ m

(2)

- (c) (i) Using the results from the table, plot a graph of braking distance against speed.

Draw a line of best fit through your points.



(3)

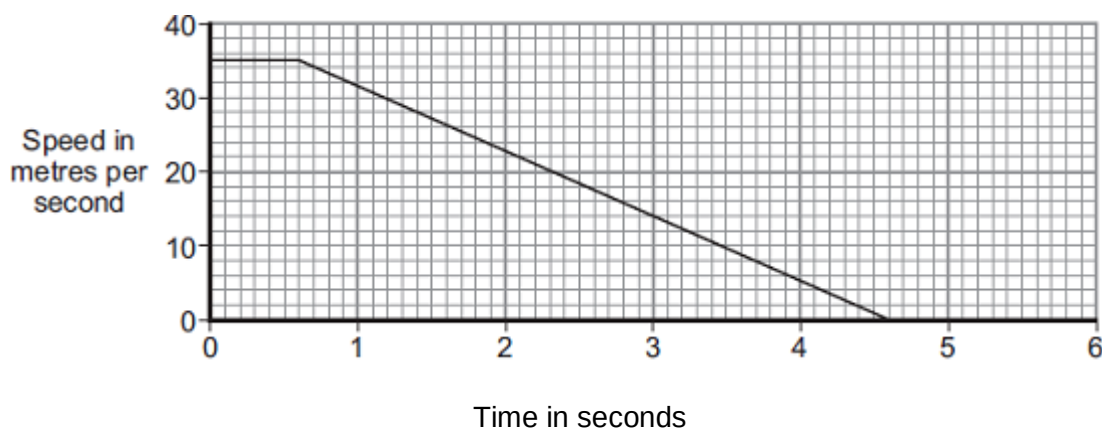
- (ii) Use your graph to determine the braking distance, in metres, at a speed of 22 m / s.

Braking distance = _____ m

(1)

- (d) The speed–time graph for a car is shown below.

While travelling at a speed of 35 m / s, the driver sees an obstacle in the road at time $t = 0$. The driver reacts and brakes to a stop.



- (i) Determine the braking distance.

Braking distance = _____ m

(3)

- (ii) If the driver was driving at 35 m / s on an icy road, the speed–time graph would be different.

Add another line to the speed–time graph above to show the effect of travelling at 35 m / s on an icy road and reacting to an obstacle in the road at time $t = 0$.

(3)

- (e) A car of mass 1200 kg is travelling with a velocity of 35 m / s.

- (i) Calculate the momentum of the car.

Give the unit.

Momentum = _____

(3)

- (ii) The car stops in 4 seconds.

Calculate the average braking force acting on the car during the 4 seconds.

Force = _____ N

(2)

(Total 19 marks)