

Physics on the Move

Questions:

Total mark – 20

1.

A student measures the time it takes for a bicycle to stop in an emergency.

She repeats the measurement to get three results.

The average time for her results is 2.72 s.

The first two results are 2.66 s and 2.60 s.

What is the value of her third result?

- A 2.63 s
- B 2.66 s
- C 2.72 s
- D 2.90 s

Your answer

[1]

2.

A scientist uses different drivers to test the stopping distances of the same car.

Look at the results.

Driver	Speed (m/s)	Thinking distance (m)	Braking distance (m)
A	8	6	6
B	16	13	24
C	32	24	96
D	16	12	22
E	8	5	6
F	32	30	120

Most of the drivers tested the car on a dry day, on a level road.

Which driver tested the car on an **icy** road?

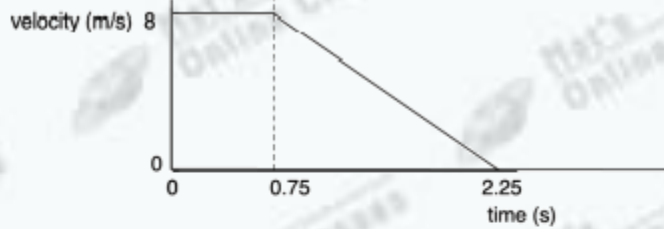
Driver tested the car on an **icy** road.

[1]

3.

(a). The car takes 6 m to brake when moving at 8 m/s.

Look at the graph of the car as it starts to brake and then stopping.



Use the graph to show that the braking distance is 6 m.

----- [2]

(b). The table shows the stopping distances for a car.

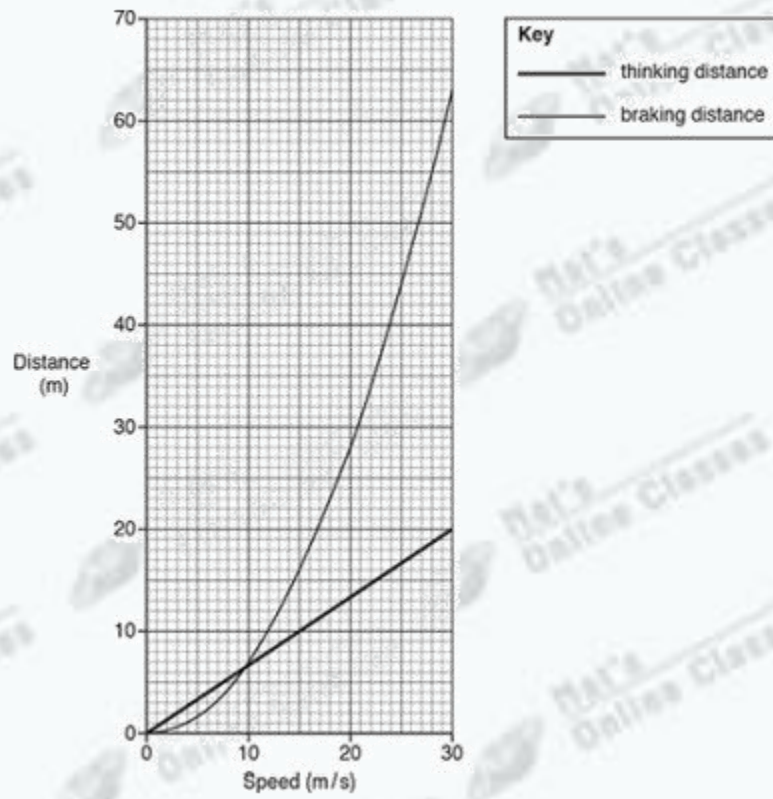
Speed of car (m/s)	Thinking distance (m)	Braking distance (m)	Total stopping distance (m)
4	3	1.5	4.5
8	6	6	12
16	12	24	36
32	24		

Use the data given to fill in the information missing at a speed of 32 m/s.

[2]

4.

a). The graph shows thinking and braking distances for a car at different speeds.



i. Use the graph to find the **thinking distance** at 24 m / s.

Thinking distance = m [1]

ii. Calculate the **thinking time** at 24 m / s.

Use your answer to (i) and the equation: distance travelled = speed × time

Give your answer to 2 decimal places.

Thinking time = s [3]

(b). Describe how **thinking distance** varies with increasing speed.

Use data from the graph in your answer.

[2]

(c). How does the speed affect the **kinetic energy** and **braking distance** of the car?

Use the graph in your answer.

[3]

(d).

- i. State **one** factor that could **increase** thinking distance.

----- [1]

- ii. Calculate the **stopping distance** at 15 m / s.

Use the graph to help you.

Stopping distance = m [2]

5.

This question is about force, mass and acceleration.

A car starts from rest and accelerates at 3 m/s^2 .

Use the equation: Acceleration = Change in velocity \div Time taken

Calculate the **velocity** of the car after 4 s.

Answer = m/s [2]