

GCSE Physics A (Gateway)

J249/04 Physics A P5-P8 and P9 (Higher Tier)

Question Set 5

1

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 | 24 |
| E | 8 | 5 | 6 |
| F | 32 | 30 | 120 |

(a) 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]

(b) Which driver has the **quickest** reaction time?

Driver has the **quickest** reaction time.

Calculate their reaction time.

Answer = s

[3]

(c) Give **two** drivers that have the **same** reaction time.

Drivers have the **same** reaction time.

Explain your answer.

[2]

(d) Driver **C** travels at 32 m/s on the road and then stops. The car has a mass of 1200 kg.

(i) Show that the **kinetic energy** stored by the car at 32 m/s is approximately 614000 J.

[2]

(ii) Describe what happens to the kinetic energy of the car as it brakes and stops.

[2]

(iii) The braking distance of the car is 96 m.

Calculate the **braking force** on the car. Give your answer to **4** significant figures.

Answer [3]

[3]

(e) Driver **B** travels at 16 m/s on the road. The thinking distance is 13 m and the braking distance is 24 m.

Driver **B** now drives the car **uphill** at the same speed on the same road.

How will driving the car **uphill** affect thinking, braking and stopping distances?

The reaction time will stay the same.

Complete the sentences.

The **thinking** distance will

The **braking** distance will

The **stopping** distance will

[2]

Total Marks for Question Set 5: 15

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