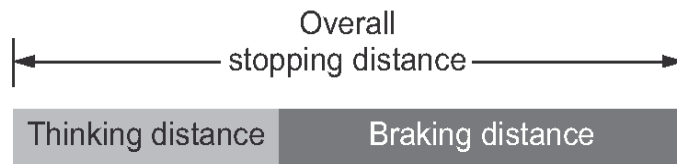


Eduqas Physics GCSE
Topic 4.3: Safety in
public transport
Questions by topic

2.

The Highway Code provides information about stopping distances.



The overall stopping distance is divided into two parts, thinking distance and braking distance.

Some of the factors which affect the overall stopping distance are shown in the table below.

Column A	Column B	Column C
speed of the vehicle	condition of the brakes or road surface conditions	alcohol or tiredness

Choose **one factor** from each column of the table and describe fully how the chosen factors affect the distances described above. [6 QWC]

In your answer, include the following:

- the three factors you have chosen;
- for each factor refer to the thinking distance, braking distance and overall stopping distance;
- describe clearly whether these distances are increased, decreased or unaffected by the factor.

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3.

The table shows the typical thinking and braking distances for a car at different speeds.

Speed in miles per hour (mph)	Thinking distance (m)	Braking distance (m)
20	6	6
30	9	14
40	12	24
50	38
60	18	56
70	21	75

(a) (i) Complete the table. [1]

(ii) Calculate the overall stopping distance at 40mph. [1]

stopping distance = m

(iii) Explain why the thinking distance changes as the speed increases. [2]

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(b) The data in the table applies to an alert driver on a dry day. Describe how the data would compare if the driver is tired. [2]

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To improve motorway safety, some motorways have chevron markers. The gap between one chevron marker and the next is 40m. Drivers are instructed to keep at least **two chevron gaps** away from the car in front.



- (c) Calculate how long it will take to travel 2 chevron gaps at the motorway speed limit of 31 m/s (70 mph) using the equation: [3]

$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

time = s

- (d) Explain why the data in the table opposite shows the two chevron rule may not keep motorists safe even if they are travelling in a car at the motorway speed limit. [2]

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5.

Cars have a number of features that make them safer in a collision.

(a) Apart from seat belts, name two safety features that reduce the risk of serious injury in a car crash.

(2)

1

2

(b) Photograph A shows a person wearing a seat belt.



seat belt

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Photograph A

(i) Using ideas of momentum and force, explain how a seat belt reduces the risk of serious injury in a car crash.

(4)

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(ii) Photograph B shows a full-body harness used in a racing car.



Photograph B

Suggest why a full-body harness is used in a racing car, instead of an ordinary seatbelt.

(1)

(c) Photograph C shows a crash-test dummy in a car. The car has crashed into a concrete wall.



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Photograph C

State what happens to the momentum of the car during the crash.

(1)
