Oxford Cambridge and RSA

GCSE Physics A (Gateway)

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

Question Set 24

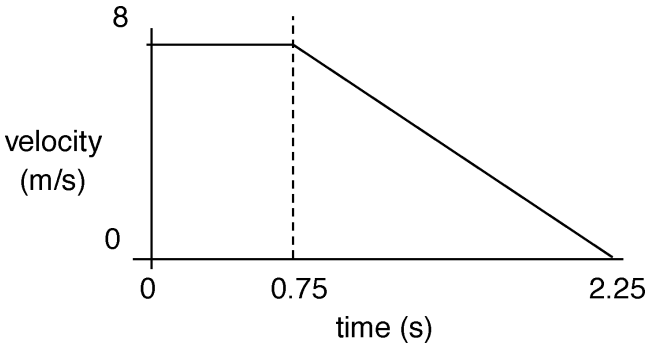
24 The table shows the stopping distances for a car.

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

(a) Add the missing results to the table at a speed of 32 m / s. **[2]**

(b) 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 stop.



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

[2]

(c) The formula to work out kinetic energy is:

$$\text{kinetic energy} = 0.5 \times \text{mass} \times (\text{velocity}^2)$$

A car has 30 000 J of energy and a mass of 1 tonne (1 tonne = 1 000 kg).

Calculate the velocity of the car and show your working.

Answer = ... m / s

[2]

(d) Cars and lorries have different brakes.

- Brakes absorb the energy of the vehicle before it comes to rest.
- The brakes on lorries have larger brake discs and brake pads than cars.
- Brakes are designed to increased air flow.

Explain why increased air flow is more important for lorries than cars.

[4]

Total Marks for Question Set 24: 10

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