0 6 Four students tested their reaction times using a computer program.

When a green light appeared on the screen the students had to press a key.

Table 3 shows their results.

Table 3

Student	Reaction time in s			Mean reaction time in s
	Test 1	Test 2	Test 3	
Boy 1	0.28	0.27	0.26	0.27
Boy 2	0.28	0.47	0.22	0.25
Girl 1	0.31	0.29	0.27	0.29
Girl 2	0.32	0.30	0.29	0.30

0 6 . 1 What is meant by 'reaction time' in this experiment?

[1 mark]

0 6 . 2 Boy 2 had an anomalous result in **Test 2**.

Suggest a reason why.

[1 mark]

0 6 . 3 Give **one** conclusion that can be made from the results in **Table 3**.

[1 mark]

0 6 . 4 Suggest further evidence that you could collect to support your conclusion.

[1 mark]

Reaction time is important at the start of a race.

Table 4 shows the time taken by a boy to run different distances.

Table 4

Distance in m	Time in s
100	12.74
200	25.63
800	139.46

0 6 . 5 Reaction time is more important in a 100 m race than in an 800 m race.

Explain why.

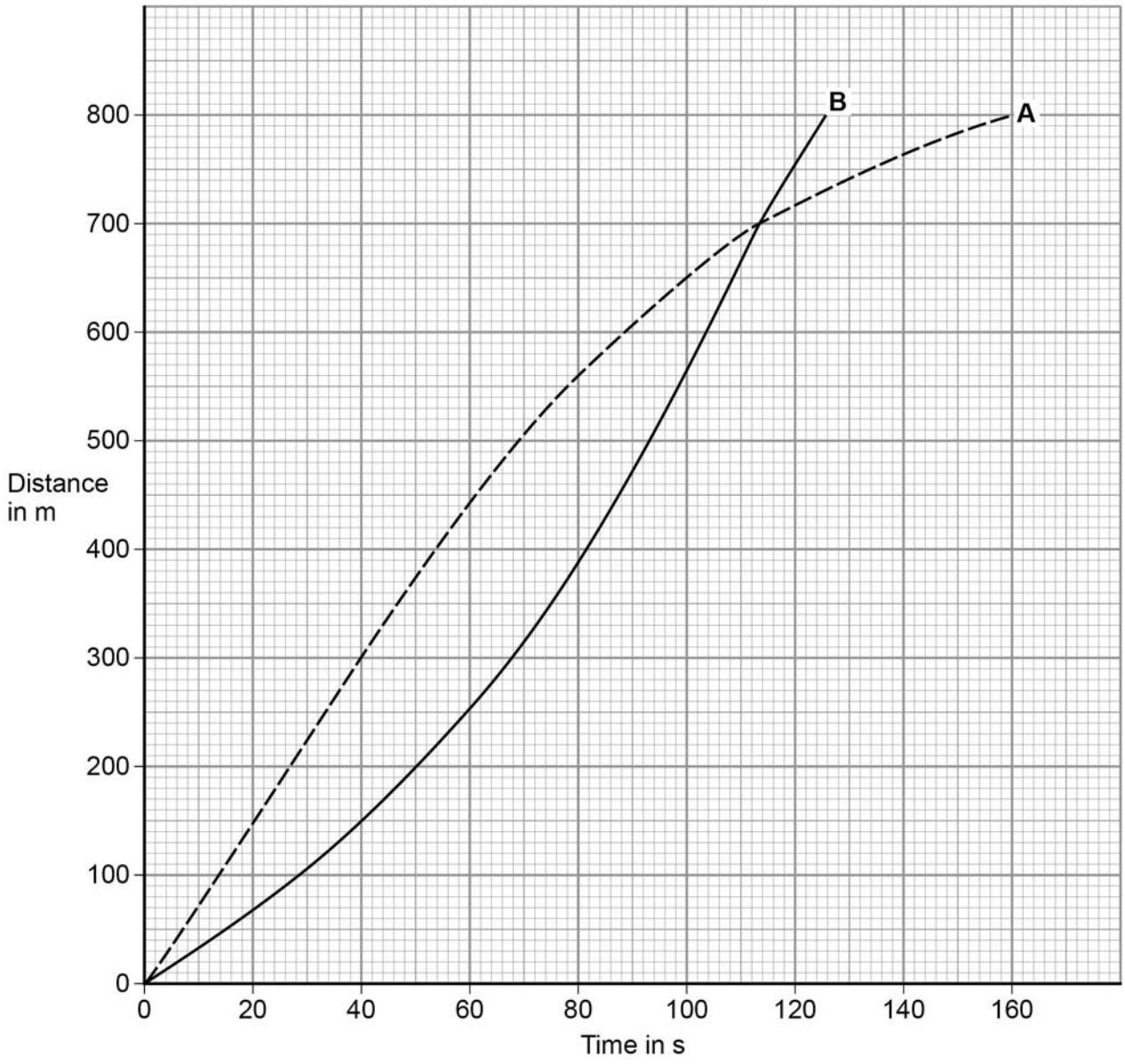
[2 marks]

Question 6 continues on the next page

Two girls, **A** and **B**, ran an 800 m race.

Figure 11 shows how the distance changed with time.

Figure 11



0 6 . 6 Compare the motion of runners **A** and **B**.

Include data from **Figure 11**.

[6 marks]

Turn over for the next question

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	the time it took from seeing the green light to pressing a key		1	AO1/1 6.5.4.3.2
06.2	he could have been distracted		1	AO3/3a 6.5.4.3.2
06.3	boys have a shorter reaction time than girls **or** reaction time improves with practice		1	AO3/2b 6.5.4.3.2 WS3.5
06.4	collect more data / larger sample size **or** take more repeat readings per person	must link to response in 06.3	1	AO3/3b 6.5.4.3.2 WS3.7
06.5	reaction time will have less effect (as distance increases) because it is a smaller proportion of the total race time		1 1	AO2/1 6.5.4.3.2

06.6	**Level 3:** A coherent description of the race, which uses data from the graph, including discussion of the meanings of the changing gradient of both of the lines.	5–6	6	AO3/1a 6.5.4.3.2 6.5.4.1.4 WS3.5
	Level 2: Multiple pieces of data taken from the graphs used to evidence a comparison between the runners. Likely to include discussion of the meaning of the (changing) gradient of one of the lines. Answer not coherently structured.	3–4		
	Level 1: Some data taken from the graph, but may be limited to one aspect or simple readings. Lack of coherence in answer.	1–2		
	No relevant content.	0		
	Indicative content • A starts at constant speed *for 440 m / 60 s* • A then slows down *from 60 s* • the gradient for B is lower at the start so B starts at a slower speed • the gradient for B increases so B accelerates • B overtook A *at 700 m /114 s* • B has a greater top speed because the maximum gradient is greater • B won the race *in 126 s* / beat A *by 34 s*			

Total			**12**