FOUNDATION & HIGHER

HIGHER EXTENDS

Name ..... Class .....

A14: Graphs in real contexts

Solve problems involving real-life graphs and models

20 marks · 25 minutes · Non-calculator

1) Cyclist A leaves at 9:00 am at 15 km/h. Cyclist B leaves the same place at 9:30 am at 20 km/h along the same road. At what time does B catch up with A?

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[Question 1: 4 marks]

2) Car hire A costs £40 per day. Car hire B costs £60 plus £25 per day. For how many days do they cost the same?

..... days

[Question 2: 3 marks]

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3) A ball's height is $h = 30t - 5t^2$ metres. For how many seconds is it more than 25 m high?

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[Question 3: 4 marks]

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4) Data plans have a linear cost: 2 GB costs £8 and 5 GB costs £14. Find the cost of an 8 GB plan.

£ .....

[Question 4: 3 marks]

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5) The taps fill a bath at 12 litres per minute. With the plug out, water drains at 8 litres per minute. Sam forgets the plug. How long does it take to collect 120 litres?

..... minutes

[Question 5: 3 marks]

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6) A car's value falls in a straight line from £18 000 to £6000 over 8 years. Find its value after 5 years.

£ .....

[Question 6: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	11:00 am	$15t = 20(t - 0.5)$ (P1, P1); $t = 2$ (P1); A1.
2	4	$40d = 60 + 25d$ (P1, P1); A1.
3	4	$30t - 5t^2 > 25$ (P1); $t^2 - 6t + 5 < 0$ (P1); $1 < t < 5$ (P1); A1.
4	£20	£2 per GB (P1); fixed £4 (P1); A1.
5	30	Net 4 litres per minute (P1); $120 \div 4$ (P1); A1.
6	£10 500	£1500 per year (P1); $18\,000 - 7500$ (P1); A1.