FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

A10: Gradients and intercepts in context

Solve problems by interpreting linear models

20 marks · 25 minutes · Non-calculator

1) Plan A costs £15 plus 5p per minute. Plan B costs 10p per minute. Which plan is cheaper for 250 minutes? For how many minutes do they cost the same?

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[Question 1: 4 marks]

2) Tank A holds 800 litres and drains at 25 litres per minute. Tank B starts empty and fills at 35 litres per minute. After how long do they hold the same amount?

..... minutes

[Question 2: 3 marks]

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3) A taxi's charges form a straight-line graph through (2, 7) and (6, 15), where x is miles and y is pounds. Find the fixed charge and the cost per mile.

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[Question 3: 3 marks]

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4) Car hire A costs £30 plus 20p per mile. B costs £50 plus 10p per mile. Which is cheaper for 150 miles, and at how many miles do they cost the same?

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[Question 4: 3 marks]

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5) A line passes through $(0, 4)$ and $(5, 0)$. Find its equation and the area enclosed by the line and the two axes.

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[Question 5: 3 marks]

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6) A 20 cm candle burns down at 2.5 cm per hour. After how many hours is it 5 cm tall?

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[Question 6: 2 marks]

7) 10 miles = 16 km and the conversion graph is a straight line through the origin. Change 45 km to miles.

..... miles

[Question 7: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	B; 300 minutes	A £27.50, B £25 (P1, P1); B (A1); $15 + 0.05m = 0.1m$ gives 300 (A1).
2	$13\frac{1}{3}$	$800 - 25t = 35t$ (P1, P1); A1.
3	£3 fixed, £2 per mile	Gradient 2 (P1); intercept 3 (P1); A1.
4	A; 200 miles	A £60, B £65 (P1); A (A1); 200 (A1).
5	$y = 4 - \frac{4}{5}x$; 10	Gradient $-\frac{4}{5}$ (P1); equation (A1); $\frac{1}{2} \times 5 \times 4$ (A1).
6	6	$20 - 2.5t = 5$ (P1); A1.
7	28.125	$45 \div 1.6$ (P1); A1.