

GCSE MATHEMATICS

Gradient and Intercept

Eduqas-style Topic Practice

Based on WJEC Eduqas GCSE (9–1) Mathematics (C300QS)

Tier: Foundation and Higher

Name _____

Date _____

ADDITIONAL MATERIALS

- A ruler may be required.
- Section A: the use of a calculator is not permitted.
- Section B: a calculator may be used.

INSTRUCTIONS TO CANDIDATES

- Use black ink or black ball-point pen. You may use a pencil for graphs and diagrams only.
- Answer all the questions in the spaces provided.

INFORMATION FOR CANDIDATES

- You should give details of your method of solution when appropriate.
- Unless stated, diagrams are not drawn to scale. Graphs drawn on a grid are accurate.
- The number of marks is given in brackets at the end of each question or part-question.
- The questions suit both Foundation and Higher tier students.
- You are reminded of the need for good English and orderly, clear presentation in your answers.
- The maximum mark for this paper is 40.

For Examiner's use only

Question	Maximum Mark	Mark Awarded
1.	3	
2.	3	
3.	2	
4.	3	
5.	3	
6.	3	
7.	3	
8.	2	
9.	7	
10.	5	
11.	6	
Total	40	

These are original practice questions written in the style of WJEC Eduqas GCSE Mathematics. They are not official WJEC Eduqas examination questions and are not endorsed by WJEC.

SECTION A

You must not use a calculator in this section.

- 1.** A straight line has equation $y = \frac{1}{4}x - 6$

(a) Write down the gradient of the line.

[1]

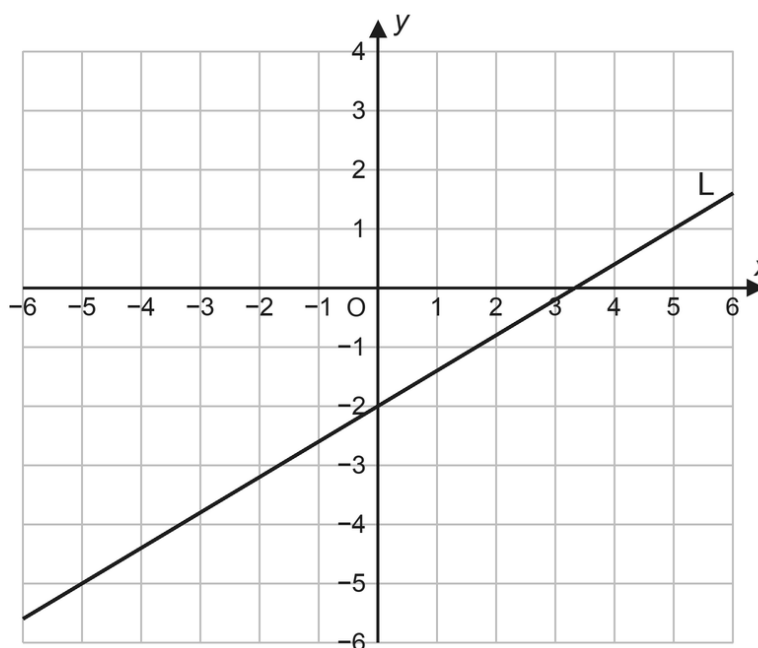
(b) Write down the coordinates of the point where the line crosses the y-axis.

[1]

(c) Write down the equation of the line that is parallel to $y = \frac{1}{4}x - 6$ and passes through the point (0, 2).

[1]

2. The grid shows a straight line, L.



- (a) Find the gradient of line L.

[2]

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- (b) Write down the equation of line L.

[1]

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3. A straight line passes through the points $(-4, 6)$ and $(7, 6)$.

- (a) Write down the gradient of the line.

[1]

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(b) Write down the equation of the line.

[1]

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4. A straight line has gradient -4 and passes through the point $(-2, 3)$.

Find the equation of the line.

[3]

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5. Ben says,

"The line $3y = 6x + 9$ has gradient 6 and crosses the y-axis at $(0, 9)$."

Ben is wrong. Explain why he is wrong, and give the correct gradient and the correct point where the line crosses the y-axis.

[3]

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6. Find the equation of the straight line that passes through the points $(-6, -1)$ and $(3, 5)$.

[3]

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7. Show that the lines $2y - 5x = 4$ and $10x - 4y = 7$ are parallel.

[3]

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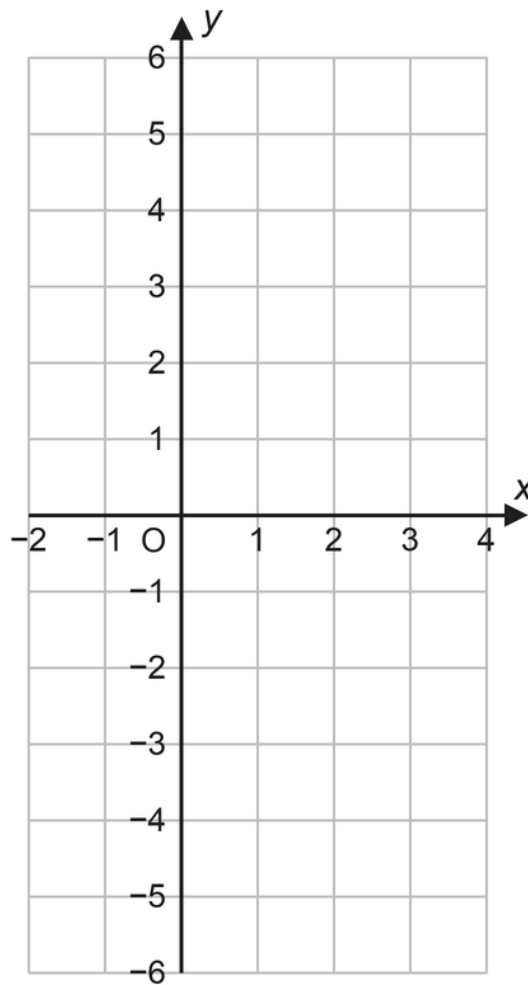
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8. On the grid, draw the straight line that has gradient 3 and passes through the point $(1, -2)$.

[2]



SECTION B

You may use a calculator in this section.

9. A hot-air balloon comes down at a constant rate. The table shows its height, h metres, t minutes after a timer is started.

Time, t (minutes)	2	5	9
Height, h (metres)	842	695	499

The graph of h against t is a straight line.

- (a) Work out the gradient of the line. [2]

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- (b) What does the gradient tell you about the balloon? [1]

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- (c) Find the height of the balloon when $t = 0$. [2]

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- (d) Work out how long after the timer is started the balloon reaches the ground.
Give your answer correct to 1 decimal place.

[2]

10. P is the point (0.8, 2.9) and Q is the point (3.3, 8.4).

- (a) Work out the gradient of the line PQ.

[2]

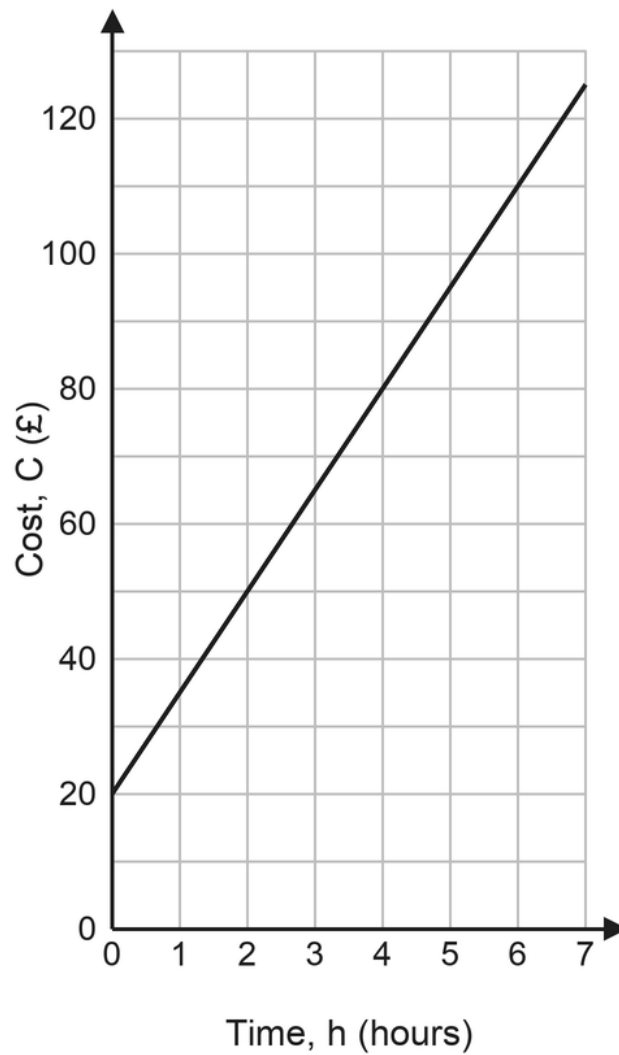
- (b) Find the equation of the line PQ. Give your answer in the form $y = mx + c$.

[2]

- (c) Line R is parallel to PQ and crosses the y-axis at (0, -3.5). Write down the equation of line R.

[1]

- 11.** The graph shows the total cost, £C, of hiring a bouncy castle for h hours. The cost is made up of a fixed charge and an hourly rate.



- (a) Write down the fixed charge.

[1]

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- (b) Work out the hourly rate.

[2]

- (c) Write down a formula for C in terms of h .

[1]

- (d) One hire cost £117.50. For how many hours was the bouncy castle hired?

[2]

END OF QUESTIONS

Mark scheme

Codes: M marks are for a correct method. A marks are for an accurate answer and depend on the M mark before them. B marks are independent of method. E marks are for an explanation. SC marks are for special cases. FT means follow through from an earlier answer, ISW ignore subsequent working, oe or equivalent, and CAO correct answer only.

For methods not covered by the mark scheme, give equivalent marks for equivalent correct work.

Section A: Non-calculator	Mark	Comment
1.(a) $\frac{1}{4}$	B1	oe, e.g. 0.25
1.(b) (0, -6)	B1	Accept $x = 0$, $y = -6$
1.(c) $y = \frac{1}{4}x + 2$	B1	oe, e.g. $y = 0.25x + 2$. FT their gradient from (a) Must be an equation.
	(3)	

Section A: Non-calculator	Mark	Comment
2.(a) $(1 - (-5)) \div (5 - (-5))$ or $3 \div 5$	M1	Any correct pair of points read from the grid, or a triangle showing 3 up for every 5 across
$\frac{3}{5}$	A1	oe, e.g. 0.6. CAO Do not accept $\frac{5}{3}$ for A1.
2.(b) $y = \frac{3}{5}x - 2$	B1	oe. FT their gradient from (a) with $c = -2$ Must be an equation.
	(3)	

Section A: Non-calculator	Mark	Comment
3.(a) 0	B1	Accept "zero"
3.(b) $y = 6$	B1	Do not accept $x = 6$
	(2)	

Section A: Non-calculator	Mark	Comment
4. $y = -4x + c$ or $3 = -4 \times (-2) + c$	M1	Substituting the point into $y = -4x + c$
$3 = 8 + c$, so $c = -5$	A1	
$y = -4x - 5$	A1	oe. CAO SC1 for $y = -4x + 11$ (from $3 = -8 + c$).
	(3)	

Section A: Non-calculator	Mark	Comment
5. He has not divided every term by 3 (the equation must be in the form $y = mx + c$ before m and c are read off)	E1	The explanation must refer to dividing by 3 or to rearranging to make y the subject
Gradient = 2	B1	
Crosses the y -axis at (0, 3)	B1	Accept $c = 3$ or y -intercept 3 Do not award E1 for "the gradient should be 2" or "he has the wrong numbers" on its own.
	(3)	

Section A: Non-calculator	Mark	Comment
6. $(5 - (-1)) \div (3 - (-6))$ or $6 \div 9$, or gradient = $\frac{2}{3}$	M1	
$-1 = \frac{2}{3} \times (-6) + c$ or $5 = \frac{2}{3} \times 3 + c$	M1	Dependent on the first M1. FT their gradient
$y = \frac{2}{3}x + 3$	A1	oe, e.g. $3y = 2x + 9$. CAO
	(3)	

Section A: Non-calculator	Mark	Comment
7. $2y = 5x + 4$, so $y = \frac{5}{2}x + 2$	M1	Either equation rearranged to make y the subject
$4y = 10x - 7$, so $y = \frac{5}{2}x - \frac{7}{4}$	M1	Both equations rearranged
Both gradients are $\frac{5}{2}$ (and the intercepts differ), so the lines are parallel	A1	Both gradients must be shown to be equal, with a conclusion Accept a comparison of 2.5 and 2.5. Do not award A1 for "both have $5x$ " or "both have $10x$ " without rearranging.
	(3)	

Section A: Non-calculator	Mark	Comment
8. A ruled straight line through (1, -2) with gradient 3, e.g. through (0, -5), (2, 1) and (3, 4)	B2	B1 for a line through (1, -2) with a different positive gradient, or a line with gradient 3 that does not pass through (1, -2) The line must be ruled and cover at least from $x = 0$ to $x = 3$.
	(2)	

Section B: Calculator allowed	Mark	Comment
9.(a) $(695 - 842) \div (5 - 2)$ or $-147 \div 3$	M1	Any correct pair of values from the table
-49	A1	CAO Do not accept 49 for A1.
9.(b) The balloon comes down 49 metres every minute	E1	FT their gradient. Must refer to height (or metres) and time (or minutes) Do not accept "the gradient is -49" on its own.
9.(c) $842 + 2 \times 49$ or $842 - 2 \times (-49)$	M1	FT their gradient
940 (metres)	A1	CAO
9.(d) $940 \div 49$ or $940 - 49t = 0$	M1	FT their (a) and (c)
19.2 (minutes)	A1	CAO. Must be correct to 1 decimal place Accept 19.18... seen, then 19.2.
	(7)	

Section B: Calculator allowed	Mark	Comment
10.(a) $(8.4 - 2.9) \div (3.3 - 0.8)$ or $5.5 \div 2.5$	M1	
2.2	A1	CAO
10.(b) $2.9 = 2.2 \times 0.8 + c$ or $8.4 = 2.2 \times 3.3 + c$	M1	FT their gradient
$y = 2.2x + 1.14$	A1	CAO
10.(c) $y = 2.2x - 3.5$	B1	FT their gradient from (a)
	(5)	

Section B: Calculator allowed	Mark	Comment
11.(a) £20	B1	Accept 20
11.(b) $(80 - 20) \div 4$ or $(110 - 20) \div 6$	M1	Any correct pair of points read from the graph
£15 (per hour)	A1	CAO
11.(c) $C = 15h + 20$	B1	oe. FT their (a) and (b) Must be a formula with C as the subject.
11.(d) $(117.5 - 20) \div 15$ or $15h + 20 = 117.5$	M1	FT their formula from (c)
6.5 (hours)	A1	CAO. Accept 6 hours 30 minutes
	(6)	

Elite Learners Specification & Assessment Objectives Summary

For teachers: this section maps the paper to WJEC Eduqas GCSE (9–1) Mathematics content and assessment objectives. It is an Elite Learners teacher resource and is not part of the Eduqas-style mark scheme.

Question	Eduqas content (Foundation / Higher)	AO	Marks
1(a)	FA10 / HA10 Gradients and intercepts	AO1	1
1(b)	FA10 / HA10 Gradients and intercepts	AO1	1
1(c)	FA9 / HA9 Parallel lines (perpendicular-line component not assessed)	AO1	1
Question 1 total			3
2(a)	FA10 / HA10 Gradients and intercepts	AO1 ×2	2
2(b)	FA10 / HA10 Gradients and intercepts	AO1	1
Question 2 total			3
3(a)	FA10 / HA10 Gradients and intercepts	AO1	1
3(b)	FA9 / HA9 Straight-line graphs	AO1	1
Question 3 total			2
4	FA9 / HA9 Equation through one point with a given gradient	AO1 ×3	3
Question 4 total			3
5	FA10 / HA10 Gradients and intercepts	AO1 ×2, AO2	3
Question 5 total			3
6	FA9 / HA9 Equation through two given points	AO1 ×3	3
Question 6 total			3
7	FA9 / HA9 Parallel lines (perpendicular-line component not assessed)	AO1 ×2, AO2	3
Question 7 total			3
8	FA9 / HA9 Straight-line graphs	AO1 ×2	2
Question 8 total			2
9(a)	FR15 / HR15 Gradient as a rate of change	AO1, AO3	2
9(b)	FR15 / HR15 Gradient as a rate of change	AO2	1
9(c)	FA10 / HA10 Gradients and intercepts	AO3 ×2	2
9(d)	FR15 / HR15 Gradient as a rate of change	AO3 ×2	2
Question 9 total			7
10(a)	FA10 / HA10 Gradients and intercepts	AO1 ×2	2
10(b)	FA9 / HA9 Equation through two given points	AO1 ×2	2
10(c)	FA9 / HA9 Parallel lines (perpendicular-line component not assessed)	AO1	1
Question 10 total			5

Question	Eduqas content (Foundation / Higher)	AO	Marks
11(a)	FA10 / HA10 Gradients and intercepts	AO2	1
11(b)	FR15 / HR15 Gradient as a rate of change	AO1, AO2	2
11(c)	FA10 / HA10 Gradients and intercepts	AO2	1
11(d)	FR15 / HR15 Gradient as a rate of change	AO3 ×2	2
Question 11 total			6
Paper total			40

Assessment objectives

AO1 — use and apply standard techniques	27 marks (67.5%)
AO2 — reason, interpret and communicate mathematically	6 marks (15%)
AO3 — solve problems within mathematics and in other contexts	7 marks (17.5%)
Total	40 marks (100%)