



5.12F Solving Simultaneous Equations Graphically: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 55 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Work out the coordinates of the intersection of the lines $y = 2x + 1$ and $y = x + 3$.

(Total for Question 1 is 1 mark)

- 2** A graph shows the lines $y = -x + 4$ and $y = \frac{1}{2}x + 1$. Work out the x-coordinate of their intersection.

(Total for Question 2 is 2 marks)

- 3** On a grid, the line L1 has equation $y = 3$ and the line L2 has equation $x = 4$. Give the coordinates of their intersection point.

(Total for Question 3 is 1 mark)

- 4** The graphs of $y = 2x - 1$ and $y = -x + 5$ are drawn on the same axes. Show how to find the intersection by solving the two equations and give the intersection coordinates.

(Total for Question 4 is 3 marks)

- 5** Two straight lines are drawn from a shop example: the cost y for buying x items from shop A is modelled by $y = 5x + 2$ (pounds), and from shop B by $y = 4x + 6$ (pounds). Use algebra to find how many items make the same cost in both shops, and state that cost.

(a) Work out the number of items x for which the cost is the same in both shops. (2)

(b) State the common cost in pounds. (2)

(Total for Question 5 is 4 marks)

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- 6** A student draws two lines on graph paper: $y = x + 2$ and $y = -2x + 8$. They think the intersection is at $x = 3$. Use substitution to check whether $x = 3$ is correct and state the correct intersection coordinates.

(a) Substitute $x = 3$ into both equations and show whether the y -values are equal. (2)

(b) Solve algebraically to find the correct intersection coordinates. (2)

(Total for Question 6 is 4 marks)

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- 7** Two lines are drawn on a graph: $y = 0.5x + 1$ and $y = 0.5x + 4$. Explain whether these lines intersect. Give the reason.

(Total for Question 7 is 2 marks)

- 8** On the same axes, the lines $y = 6$ and $y = x + 2$ meet. Work out the x-coordinate where they meet and give the intersection point.

(Total for Question 8 is 2 marks)

- 9** The lines $y = 3x - 2$ and $y = x + 4$ intersect. Work out the coordinates of the point of intersection.

(Total for Question 9 is 2 marks)

Mark scheme · 5.12F Solving Simultaneous Equations Graphically: Foundation Tier Practice

Question 1

- **B1** (2, 5) cao
- **Answer:** (2, 5)

Question 2

- **M1** equate: $-x + 4 = (1/2)x + 1$ or equivalent method
- **A1** $x = 2$ cao
- **Answer:** 2

Question 3

- **B1** (4, 3) cao
- **Answer:** (4, 3)

Question 4

- **M1** equate: $2x - 1 = -x + 5$ or equivalent
- **M1** solve: $3x = 6$ or $x = 2$
- **A1** (2, 3) cao
- **Answer:** (2, 3)

Question 5

- (a) **M1** equate $5x + 2 = 4x + 6$ or equivalent
- (a) **A1** $x = 4$ cao
- (a) **Answer:** 4
- (b) **M1** substitute $x = 4$ into one equation, e.g. $5 \cdot 4 + 2 = 22$
- (b) **A1** 22 pounds cao
- (b) **Answer:** 22 pounds

Question 6

- (a) **M1** $y_1 = 3 + 2 = 5$ and $y_2 = -2 \cdot 3 + 8 = 2$ shown
- (a) **A1** conclusion: not equal so $x = 3$ is incorrect
- (a) **Answer:** Not equal; $y_1 = 5$, $y_2 = 2$, so $x = 3$ is incorrect.
- (b) **M1** equate $x + 2 = -2x + 8$ and solve to get $3x = 6$
- (b) **A1** (2, 4) cao
- (b) **Answer:** (2, 4)

Question 7

- **B1** state: they are parallel so do not intersect
- **B1** reason: same gradient 0.5 but different intercepts 1 and 4 oe
- **Answer:** They do not intersect because both have gradient 0.5 but different y-intercepts, so the lines are parallel.

Question 8

- **M1** set $6 = x + 2$ and solve
- **A1** $x = 4$ and intersection (4, 6) cao
- **Answer:** (4, 6)

Question 9

- **M1** equate $3x - 2 = x + 4$ or equivalent method
- **A1** (3, 7) cao
- **Answer:** (3, 7)