1.12 Coordinates: Test Pack

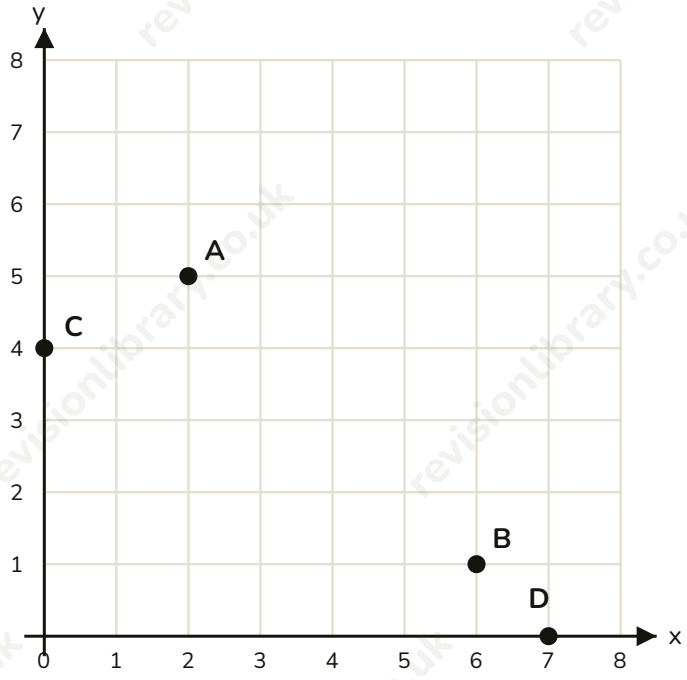
EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 The diagram shows a coordinate grid. The x-axis and y-axis are both numbered from 0 to 8. Four points are plotted: A is 2 units across and 5 units up from the origin. B is 6 units across and 1 unit up. C is on the y-axis, 4 units up from the origin. D is on the x-axis, 7 units across from the origin.



(a) Write down the coordinates of point A. **(1)**

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(b) Write down the coordinates of point B. **(1)**

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(c) Write down the coordinates of point C. **(1)**

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(d) Write down the coordinates of point D. **(1)**

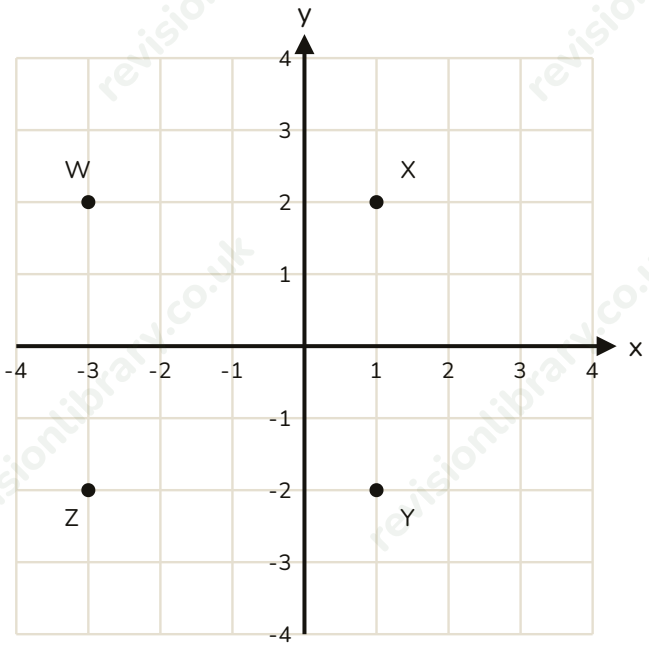
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(Total for Question 1 is 4 marks)

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2 Four points are plotted on a coordinate grid: W(-3, 2), X(1, 2), Y(1, -2) and Z(-3, -2). Write down the mathematical name of the quadrilateral WXYZ. Give a reason for your answer.

Diagram NOT accurately drawn



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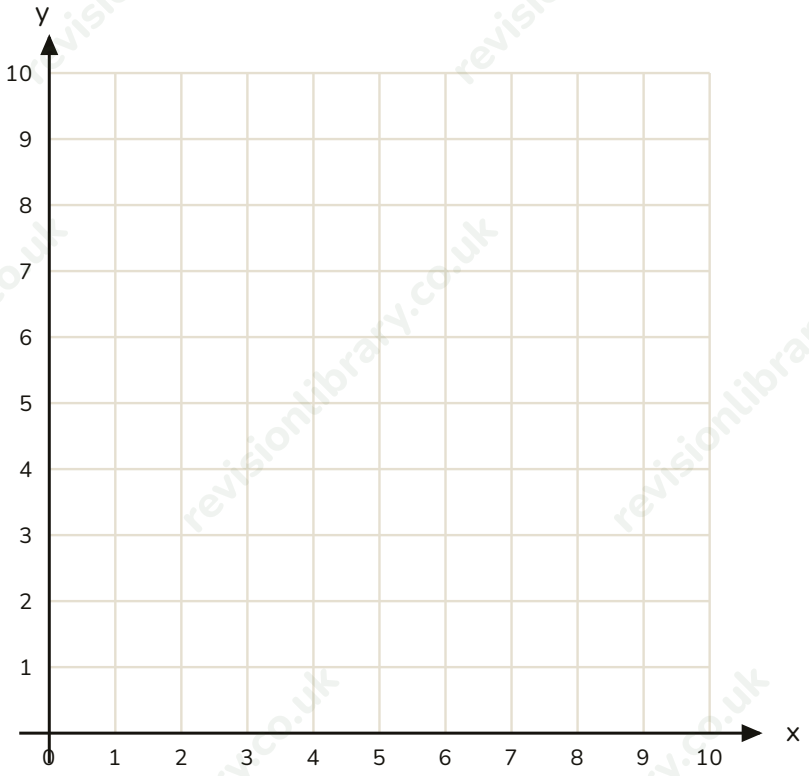
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(Total for Question 2 is 3 marks)

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3 A coordinate grid has the x-axis and y-axis both numbered from 0 to 10. Plot each of the following points on the grid and label it with the correct letter.



(a) Plot the point E(3, 7). **(1)**

(b) Plot the point F(9, 2). **(1)**

(c) Plot the point G(0, 6). **(1)**

(d) Plot the point H(5, 0). **(1)**

(Total for Question 3 is 4 marks)

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4 Point J is at (3, 5) and point K is at (3, -2). J and K lie on the same vertical gridline. Work out the vertical distance between J and K.

(Total for Question 4 is 2 marks)

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5 Three points are plotted on a grid: P(-5, 4), Q(1, 4) and R(8, 4).

(a) Show that P, Q and R lie on a straight horizontal line, and write down the equation of this line. **(3)**

(b) State whether the point (100, 4) also lies on this line. **(1)**

(Total for Question 5 is 4 marks)

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6 Point B is 3 units to the right of the origin and 4 units below the origin. Give the coordinates of B.

(Total for Question 6 is 1 mark)

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7 The point (0, -6) lies on one of the axes. State which axis it lies on.

(Total for Question 7 is 1 mark)

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8 A pupil, Yusuf, was asked to write down the coordinates of the point that is 5 units to the left of the y-axis and 3 units below the x-axis. Yusuf wrote (5, -3).

(a) Explain the mistake Yusuf has made. **(2)**

(b) Write down the correct coordinates. **(1)**

(Total for Question 8 is 3 marks)

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9 A coach travels in a straight line from the school, at (-8, 2), to a service station at (10, 2), where each grid unit represents 4 kilometres.

(a) The coach stops for a break exactly halfway between the school and the service station. Work out the coordinates of the stopping point. **(2)**

(b) Work out the total distance, in kilometres, from the school to the service station. **(2)**

(c) The coach then continues in a straight vertical line from the service station at (10, 2) to the final destination at (10, -9). Work out the distance travelled from the service station to the final destination, in kilometres. **(2)**

(Total for Question 9 is 6 marks)

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10 A student, Erin, says: 'If you translate a point 5 units up and then 5 units down, you always end up back at the point you started with, whatever point you start at.' Decide whether Erin is correct. Justify your answer with an example.

(Total for Question 10 is 2 marks)

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11 The point M(-3, k) lies directly above the point N(-3, -2). The distance MN is 9 units. Work out the value of k.

(Total for Question 11 is 2 marks)

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12 Find the midpoint of P(-7, -1) and Q(5, 3).

(Total for Question 12 is 2 marks)

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13 Ffion is asked to find the midpoint of P(-5, 2) and Q(3, 8). Her working is shown below:

midpoint = ((3 - (-5)) / 2, (8 - 2) / 2) = (4, 3)

Ffion's answer is incorrect. Identify her mistake, then work out the correct midpoint.

(Total for Question 13 is 3 marks)

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14 A quadrilateral PQRS has vertices P(-2, -1), Q(4, 1), R(6, 5) and S(0, 3). Show that PQRS is a parallelogram by showing that its diagonals PR and QS have the same midpoint.

(Total for Question 14 is 4 marks)

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15 E(1, 2), F(5, 3) and G(7, 7) are three vertices of parallelogram EFGH, given in order round the shape. The diagonals of a parallelogram bisect each other. Find the coordinates of the fourth vertex H.

(Total for Question 15 is 3 marks)

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Mark scheme · 1.12 Coordinates: Test Pack

Question 1

(a) (2, 5) cao **B1**

(a) Answer: (2, 5)

(b) (6, 1) cao **B1**

(b) Answer: (6, 1)

(c) (0, 4) cao **B1**

(c) Answer: (0, 4)

(d) (7, 0) cao **B1**

(d) Answer: (7, 0)

Question 2

at least two correct side lengths found, e.g. WX = 4 and XY = 4 **M1**

correct reasoning that all four sides are equal length and all angles are right angles, oe (ft from M1) **A1**

square cao **B1**

Answer: Square (all four sides have length 4 units and all angles are 90 degrees)

Question 3

(a) point plotted at (3, 7), labelled E **B1**

(a) Answer: Point plotted 3 across, 7 up

(b) point plotted at (9, 2), labelled F **B1**

(b) Answer: Point plotted 9 across, 2 up

(c) point plotted at (0, 6), labelled G, on the y-axis **B1**

(c) Answer: Point plotted on the y-axis, 6 up

(d) point plotted at (5, 0), labelled H, on the x-axis **B1**

(d) Answer: Point plotted on the x-axis, 5 across

Question 4

correct method, e.g. 5 - (-2) oe, or squares counted correctly **M1**

7 (units) cao **A1**

Answer: 7 units

Question 5

(a) P, Q and R all have y-coordinate 4 **B1**

(a) points with the same y-coordinate lie on a horizontal line, oe, so P, Q and R are collinear **B1**

(a) y = 4 cao **B1**

(a) Answer: P, Q and R are collinear because they all have y-coordinate 4; the line is y = 4.

(b) yes, oe, because its y-coordinate is 4 **B1**

(b) Answer: Yes

Question 6

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

Answer: (3, -4)

Question 7

y-axis oe **B1**

Answer: y-axis

Question 8

(a) identifies that Yusuf has used a positive x-coordinate **B1**

(a) correct reason, e.g. 'to the left of the y-axis' means the x-coordinate should be negative, oe **B1**

(a) Answer: Yusuf wrote the x-coordinate as positive 5, but 'to the left of the y-axis' means the x-coordinate should be negative.

(b) (-5, -3) cao **B1**

(b) Answer: (-5, -3)

Question 9

(a) correct method, e.g. (-8 + 10)/2 and/or (2 + 2)/2 **M1**

(a) (1, 2) cao **A1**

(a) Answer: (1, 2)

(b) correct method, e.g. 10 - (-8) = 18 (units), oe **M1**

(b) 72 km cao **A1**

(b) Answer: 72 km

(c) correct method, e.g. 2 - (-9) = 11 (units), oe **M1**

(c) 44 km cao **A1**

(c) Answer: 44 km

Question 10

correct cao **B1**

valid example showing the point returns to its start, e.g. starting at (2, 3): 5 up gives (2, 8), then 5 down gives (2, 3) **B1**

Answer: Erin is correct. For example, starting at (2, 3): 5 up gives (2, 8), then 5 down from (2, 8) gives (2, 3), the original point.

Question 11

set up k - (-2) = 9 or equivalent equation for k, shown **M1**

7 cao **A1**

Answer: 7

Question 12

calculate midpoint: ((-7+5)/2, (-1+3)/2) shown **M1**

(-1, 1) cao **A1**

Answer: (-1, 1)

Question 13

identifies that Ffion has subtracted the coordinates (found half the difference between them) instead of adding them and dividing by 2 oe **B1**

correct method: ((-5+3)/2, (2+8)/2) shown **M1**

(-1, 5) cao **A1**

Answer: Ffion subtracted the coordinates and halved the difference instead of adding them and halving; correct midpoint = (-1, 5)

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Question 14

midpoint of PR: ((-2+6)/2, (-1+5)/2) shown	**M1**
midpoint of QS: ((4+0)/2, (1+3)/2) shown	**M1**
both midpoints = (2, 2) cso	**A1**
correct conclusion: since the diagonals share the same midpoint they bisect each other, so PQRS is a parallelogram	**C1**

Answer: (2, 2); both diagonals share this midpoint, so PQRS is a parallelogram

Question 15

midpoint of diagonal EG: ((1+7)/2, (2+7)/2) = (4, 4.5) shown	**M1**
use midpoint of FH equal to midpoint of EG to set up an equation for H, e.g. (5+x)/2 = 4 and (3+y)/2 = 4.5, shown	**M1**
(3, 6) cao	**A1**

Answer: (3, 6)

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