3.15 Drawing Linear Graphs: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Plot the three points from the table on graph paper and draw the straight line joining them.

x: 0, 1, 2

y: 0, 3, 6

(Total for Question 1 is 2 marks)

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2 Plot the three points from the table on graph paper and draw the straight line joining them.

x: 0, 1, 2

y: 5, 3, 1

(Total for Question 2 is 2 marks)

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3 Plot the three points from the table on graph paper and draw the straight line joining them.

x: 2, 4, 6

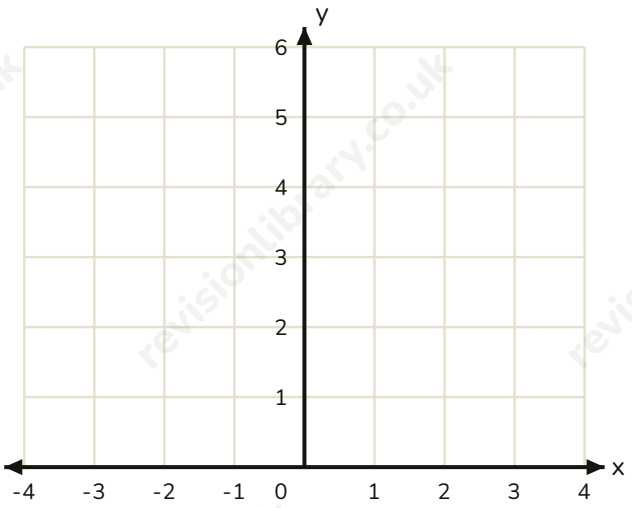
y: -2, 0, 2

(Total for Question 3 is 2 marks)

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4 A straight line has equation $y = 0.5x + 3$.

x	-4	-2	0	2	4
y	1		3		



(a) Complete the table of values for $y = 0.5x + 3$. **(1)**

(b) Draw the graph of $y = 0.5x + 3$ on the grid, for values of x from -4 to 4. **(2)**

(Total for Question 4 is 3 marks)

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5 The line $y = -3x + 1$ passes through the point (a, -2).
Work out the value of a.

(Total for Question 5 is 3 marks)

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6 A line has equation $y = 3x + 12$.
Work out the coordinates of the points where the line crosses (a) the y-axis, (b) the x-axis.

(Total for Question 6 is 3 marks)

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7 A straight line has equation $y = 2x - 4$.
Write down the gradient of the line and the y-intercept.

(Total for Question 7 is 2 marks)

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8 Does the point (-2, -4) lie on the line $y = 4x + 2$?
You must show your working.

(Total for Question 8 is 2 marks)

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9 A straight line has equation $y = x - 1$.

x	0	1	2	3
y	-1			2

(a) Complete the table of values for $y = x - 1$. **(1)**

(b) Write down the coordinates of two points that lie on the line $y = x - 1$. **(1)**

.....

(Total for Question 9 is 2 marks)

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10 The table shows values of y for a straight line.

x: 0, 2, 4

y: 1, 3, 5

(a) Plot the points and draw the straight line. **(2)**

(b) Use your line to work out the value of y when x = 3. **(1)**

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(Total for Question 10 is 3 marks)

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11 A taxi charges cost p pounds given by p = 2x + 1, where x is the number of miles. How many miles can you travel for p = 9?

(Total for Question 11 is 2 marks)

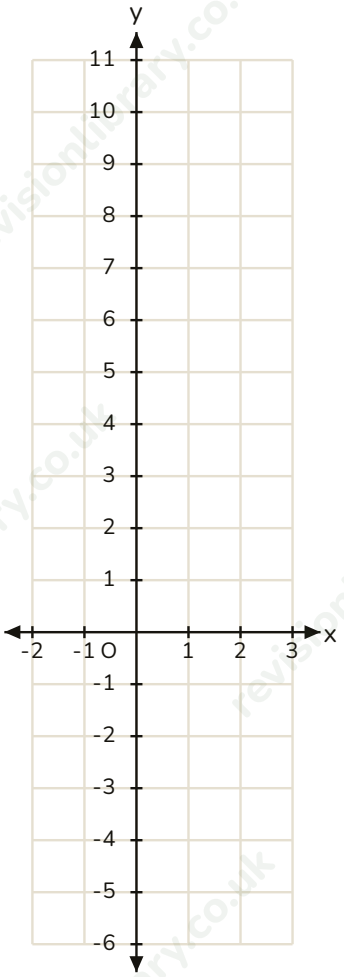
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12 Find the coordinates of the midpoint of the line segment joining the points A(-3, 5) and B(5, -1).

(Total for Question 12 is 2 marks)

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13 A straight line passes through the point (0, 4) and has gradient -3.



(a) Write down the equation of the line. **(1)**

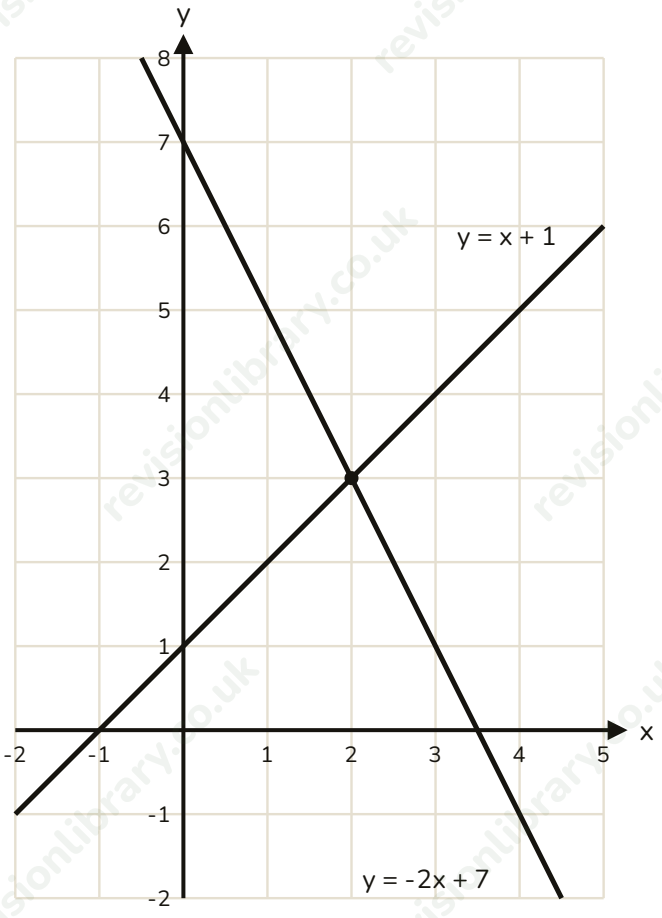
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(b) Draw the graph of the line on the grid, for values of x from -2 to 3. **(2)**

(Total for Question 13 is 3 marks)

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14 The diagram shows the graphs of y = x + 1 and y = -2x + 7 drawn on the same grid, intersecting at a single point. Use the graphs to write down the solution to the simultaneous equations y = x + 1 and y = -2x + 7.



(Total for Question 14 is 2 marks)

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15 Plot the point with coordinates (3, -2) on a pair of axes.

(Total for Question 15 is 1 mark)

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16 The line through (1, 1) and (3, 5) is given.

(a) Find the equation of this line in the form y = mx + c. **(2)**

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(b) Find x when y = 9. You may use your answer from part (a). **(2)**

.....

(Total for Question 16 is 4 marks)

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17 Given the line L1: 4x - 2y + 6 = 0.

(a) Rearrange 4x - 2y + 6 = 0 to y = mx + c. **(3)**

(b) Give the equation of L3, the image of L1 under translation 3 units right and 2 units up. Include a brief sketch showing both lines labelled. **(5)**

(Total for Question 17 is 8 marks)

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Mark scheme · 3.15 Drawing Linear Graphs: 1-hour Pack

Question 1

at least two points plotted correctly and a straight line drawn through them (oe) **M1**

all three points plotted accurately and correct straight line (cao) **A1**

Answer: Line with equation y = 3x, passing through (0,0), (1,3), (2,6).

Question 2

at least two points plotted correctly and a straight line drawn through them (oe) **M1**

all three points plotted accurately and correct straight line (cao) **A1**

Answer: Line with equation y = -2x + 5, passing through (0,5), (1,3), (2,1).

Question 3

at least two points plotted correctly and a straight line drawn through them (oe) **M1**

all three points plotted accurately and correct straight line (cao) **A1**

Answer: Line with equation y = x - 4, passing through (2,-2), (4,0), (6,2).

Question 4

(a) all three missing values correct: 2, 4, 5 **B1**

(a) Answer: x = -2 gives y = 2; x = 2 gives y = 4; x = 4 gives y = 5

(b) all 5 points correctly plotted ft candidate's table **B1**

(b) correct straight line drawn through the points **B1**

(b) Answer: Line through (-4,1), (-2,2), (0,3), (2,4), (4,5).

Question 5

-2 = -3a + 1 **M1**

correct rearrangement **M1**

a = 1 **A1**

Answer: a = 1

Question 6

(0, 12) **B1**

sets y = 0 **M1**

(-4, 0) **A1**

Answer: (0, 12) and (-4, 0)

Question 7

gradient 2 **B1**

y-intercept -4 **B1**

Answer: gradient 2, y-intercept -4

Question 8

substitutes x = -2 to get y = -6 **M1**

correct conclusion with a comparison **A1**

Answer: No

Question 9

(a) both missing values correct: 0 and 1 **B1**

(a) Answer: x = 1 gives y = 0; x = 2 gives y = 1

(b) any two correct coordinate pairs from the table, ft candidate's table **B1**

(b) Answer: e.g. (1, 0) and (2, 1)

Question 10

(a) at least two points plotted correctly and a straight line drawn through them (oe) **M1**

(a) all three points plotted accurately and correct straight line (cao) **A1**

(a) Answer: Line with equation y = x + 1, passing through (0,1), (2,3), (4,5).

(b) 4 cao ft from correct line **A1**

(b) Answer: 4

Question 11

substitute 9 = 2x + 1 and isolate x **M1**

4 miles cao **A1**

Answer: 4 miles

Question 12

((-3 + 5)/2, (5 + (-1))/2) oe **M1**

(1, 2) cao **A1**

Answer: (1, 2)

Question 13

(a) y = -3x + 4 oe cao **B1**

(a) Answer: y = -3x + 4

(b) correct points plotted ft part (a): (-2,10), (-1,7), (0,4), (1,1), (2,-2), (3,-5) **B1**

(b) correct straight line drawn through the points **B1**

(b) Answer: Line through (-2,10), (-1,7), (0,4), (1,1), (2,-2), (3,-5).

Question 14

identifies the point of intersection of the two lines on the graph **M1**

x = 2, y = 3 oe (2, 3) **A1**

Answer: x = 2, y = 3

Question 15

point plotted at (3, -2) within tolerance (correct quadrant and position) oe **B1**

Answer: (3, -2)

Question 16

(a) find gradient: (5 - 1) / (3 - 1) = 2 **M1**

(a) y = 2x - 1 cao **A1**

(a) Answer: y = 2x - 1

(b) substitute 9 = 2x - 1 and solve **M1**

(b) 5 cao **A1**

(b) Answer: 5

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Question 17

(a) isolate term -2y = -4x -6 or equivalent	**M1**
(a) divide by -2 to get y = 2x + 3	**M1**
(a) y = 2x + 3 cao	**A1**

(a) Answer: y = 2x + 3

(b) understand translation shifts every point: use general point (x, y) on L1 and map to (x + 3, y + 2) or shift intercepts	**M1**
(b) substitute x' = x + 3, y' = y + 2 into y = 2x + 3 or transform intercept: y' - 2 = 2(x' - 3) + 3	**M1**
(b) simplify to find equation in y' and x': y' = 2x' - 1 or equivalent correct algebra	**M1**
(b) sketch shows two parallel lines with correct relative shift (L3 above and right of L1) oe	**B1**
(b) final equation L3: y = 2x - 1 cao	**A1**

(b) Answer: y = 2x - 1

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