3.15 Drawing Linear Graphs: Test Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Complete the table for the function $y = 2x + 1$.

(a) Find y when x = 0. **(1)**

.....

(b) Find y when x = 1. **(1)**

.....

(c) Find y when x = 2. **(1)**

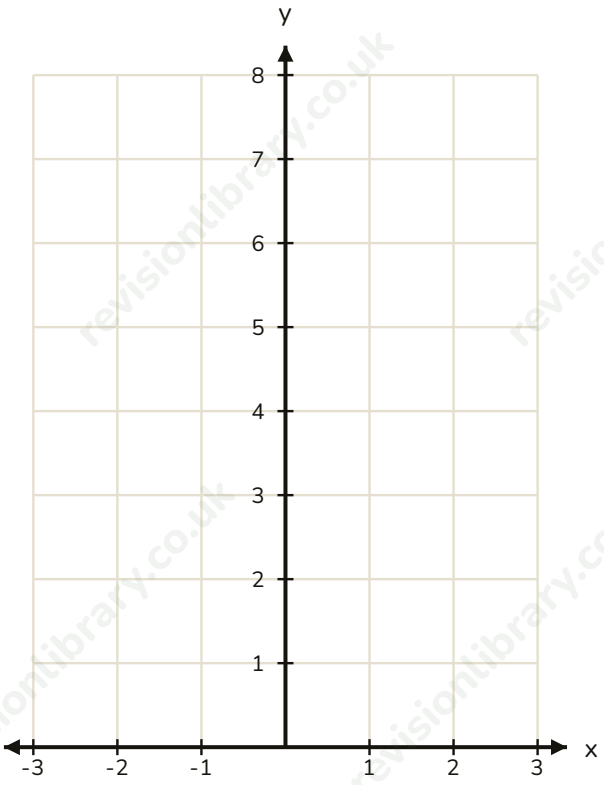
.....

(Total for Question 1 is 3 marks)

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2 The table shows some values for $y = x + 4$. Complete the table of values and draw the graph of $y = x + 4$.

x	-2	-1	0	1	2
y			4		6



(Total for Question 2 is 3 marks)

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3 Circle the correct point in each case.

(a) Which of these points lies on the line with equation $y = 2x + 1$? **(1)**

- ☐ A) (1, 2)
- ☐ B) (2, 4)
- ☐ C) (3, 7)
- ☐ D) (0, 0)

(b) Which of these points lies on the line with equation $y = 3x - 2$? **(1)**

- ☐ A) (1, 1)
- ☐ B) (2, 3)
- ☐ C) (0, 5)
- ☐ D) (-1, 0)

(Total for Question 3 is 2 marks)

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

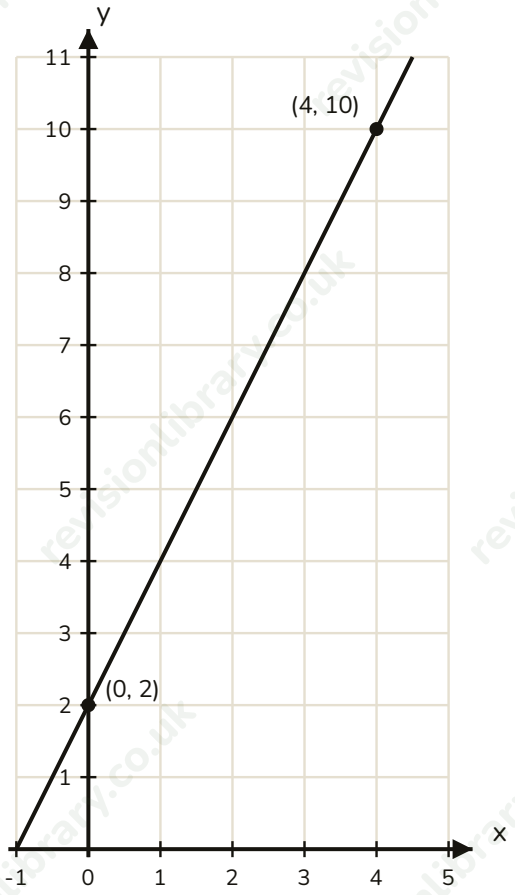
x: 0, 2, 4

y: -1, 0, 1

(Total for Question 4 is 2 marks)

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5 The diagram shows a straight line drawn on a grid. The line passes through the points (0, 2) and (4, 10).



(a) Work out the gradient of the line. **(1)**

.....

(b) Write down the y-intercept of the line. **(1)**

.....

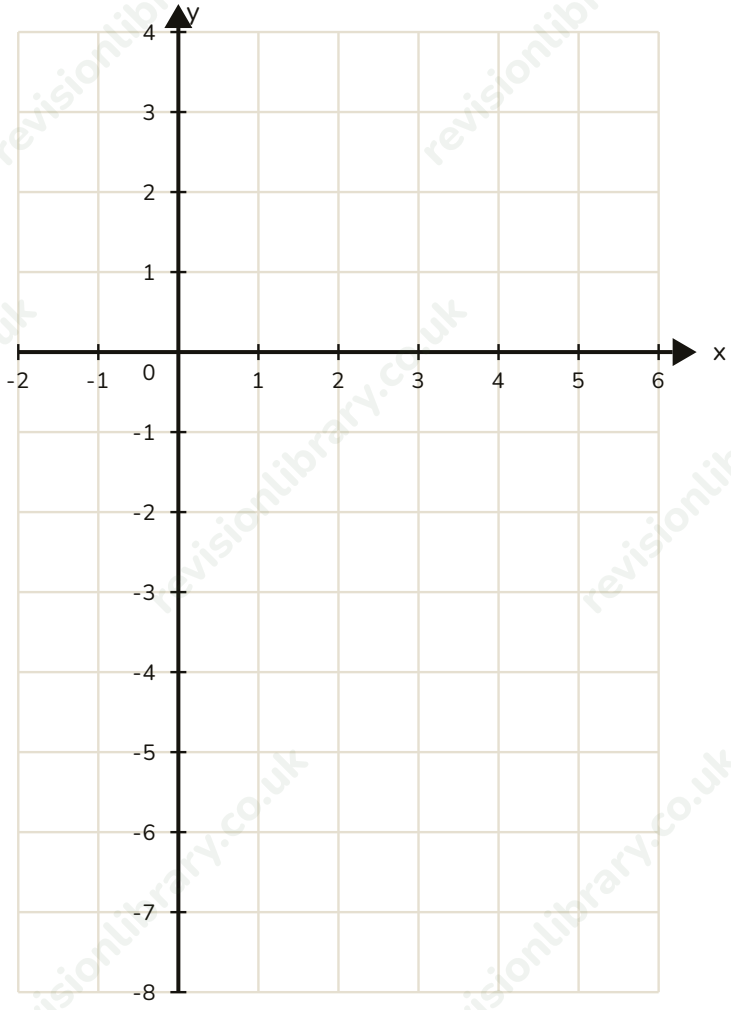
(c) Write down the equation of the line. **(1)**

.....

(Total for Question 5 is 3 marks)

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6 A straight line has equation $3x - 2y = 12$.



(a) Find the coordinates of the point where the line crosses the x-axis. **(1)**

.....

(b) Find the coordinates of the point where the line crosses the y-axis. **(1)**

.....

(c) Draw the graph of $3x - 2y = 12$ on the grid. **(1)**

(Total for Question 6 is 3 marks)

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7 Does the point (3, -7) lie on the line $y = -x - 4$?
You must show your working.

(Total for Question 7 is 2 marks)

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

(Total for Question 8 is 3 marks)

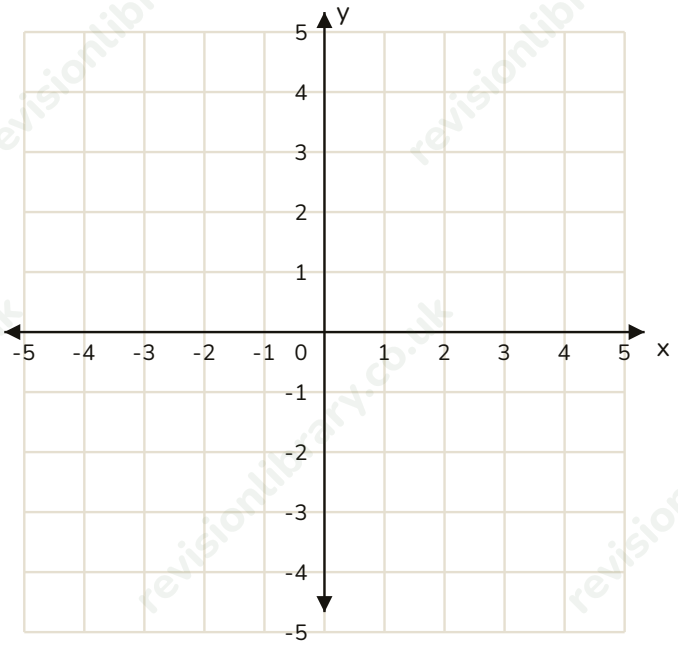
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9 A straight line has equation $y = 4x + 6$.
Write down the gradient of the line and the y-intercept.

(Total for Question 9 is 2 marks)

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10 On the grid provided, draw the following straight lines.



(a) Draw the graph of $x = -3$. **(1)**

(b) Draw the graph of $y = 2$. **(1)**

(Total for Question 10 is 2 marks)

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11 A straight line has gradient 1 and passes through the point (2, 5). Write down the equation of this line in the form $y = mx + c$.

(Total for Question 11 is 2 marks)

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12 Line L1 has equation $y = 2x - 5$. Line L2 is parallel to L1 and passes through the point (0, 3).

(a) Write down the equation of line L2. **(1)**

(b) Show that the point (4, 10) does not lie on line L2. **(2)**

(Total for Question 12 is 3 marks)

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13 The table gives two values for x and y on a straight line. Find the equation of the line. Then use the equation to find x when $y = 10$.

x: 1, 3

y: 4, 8

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

(b) Work out the value of x when $y = 10$. **(2)**

(Total for Question 13 is 4 marks)

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14 A taxi company charges a fare y (in pounds) according to the rule $y = 1.5x + 2$, where x is the distance in miles. Complete the table, plot the points and draw the straight line. Then estimate the distance when the fare is £11.50.

x: 0, 2, 4, 6

y:

(a) Complete the table and plot the points, then draw the straight line. **(2)**

(b) Estimate the distance x when the fare is £11.50, using your plotted line or the equation. **(2)**

(Total for Question 14 is 4 marks)

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15 The line L has equation $y = ax + 4$ and passes through the point (6, -2).

(a) Find the value of a. **(2)**

.....

(b) State the equation of the line perpendicular to L through (6, -2). **(3)**

(Total for Question 15 is 5 marks)

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Mark scheme · 3.15 Drawing Linear Graphs: Test Pack

Question 1

(a) 1 cao **B1**

(a) Answer: 1

(b) 3 cao **B1**

(b) Answer: 3

(c) 5 cao **B1**

(c) Answer: 5

Question 2

correct table values 2, 3, 5 (all three correct) **B1**

correct straight line drawn from (-2,2) to (2,6) (B1 for at least 4 of the 5 points correctly plotted if the line is not fully correct) **B2**

Answer: Table values: 2, 3, 5. Straight line through (-2,2), (-1,3), (0,4), (1,5), (2,6).

Question 3

(a) C cao **B1**

(a) Answer: C) (3, 7)

(b) A cao **B1**

(b) Answer: A) (1, 1)

Question 4

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 = 1/2 x - 1, passing through (0,-1), (2,0), (4,1).

Question 5

(a) (10 - 2) / (4 - 0) = 2 cao **M1**

(a) Answer: 2

(b) 2 cao **B1**

(b) Answer: 2

(c) y = 2x + 2 oe, ft parts (a) and (b) **B1**

(c) Answer: y = 2x + 2

Question 6

(a) substitutes y = 0 to get (4, 0) cao **M1**

(a) Answer: (4, 0)

(b) substitutes x = 0 to get (0, -6) cao **M1**

(b) Answer: (0, -6)

(c) correct straight line drawn through (4,0) and (0,-6), ft parts (a) and (b) **B1**

(c) Answer: Straight line through (4, 0) and (0, -6).

Question 7

substitutes x = 3 to get y = -7 **M1**

correct conclusion with a comparison **A1**

Answer: Yes

Question 8

-1 = -2a - 1 **M1**

correct rearrangement **M1**

a = 0 **A1**

Answer: a = 0

Question 9

gradient 4 **B1**

y-intercept 6 **B1**

Answer: gradient 4, y-intercept 6

Question 10

(a) correct vertical line drawn through x = -3 **B1**

(a) Answer: Vertical line through every point with x-coordinate -3.

(b) correct horizontal line drawn through y = 2 **B1**

(b) Answer: Horizontal line through every point with y-coordinate 2.

Question 11

substitute 5 = 1*2 + c to find c **M1**

y = x + 3 cao **A1**

Answer: y = x + 3

Question 12

(a) y = 2x + 3 oe cao **B1**

(a) Answer: y = 2x + 3

(b) substitutes x = 4 into the equation of L2: 2(4) + 3 **M1**

(b) 11 does not equal 10, so the point does not lie on L2, cso **A1**

(b) Answer: y = 11 when x = 4, and 11 does not equal 10, so (4, 10) does not lie on L2.

Question 13

(a) correct method to find gradient: (8 - 4) / (3 - 1) = 2 **M1**

(a) y = 2x + 2 cao **A1**

(a) Answer: y = 2x + 2

(b) substitute and solve: 10 = 2x + 2 -> 2x = 8 -> x = 4 **M1**

(b) 4 cao **A1**

(b) Answer: 4

Question 14

(a) correct method to find two or more y values and at least two points plotted (oe) **M1**

(a) all four y values correct and correct straight line drawn (cao) **A1**

(a) Answer: y values: 2, 5, 8, 11 for x = 0,2,4,6 respectively. Line y = 1.5x + 2.

(b) use equation or reading from graph: 11.5 = 1.5x + 2 -> 1.5x = 9.5 -> x = 9.5/1.5 **M1**

(b) 6.33 cao, or 6.3 to 2 s.f. (awrt) **A1**

(b) Answer: 6.33 (miles) awrt

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Question 15

(a) substitute (6, -2) into y = ax + 4: -2 = 6a + 4 and form 6a = -6 **M1**

(a) a = -1 cao **A1**

(a) Answer: a = -1

(b) use perpendicular gradient product = -1: gradient of L is -1 so perpendicular gradient = 1 **M1**

(b) use point (6, -2) to form equation y = x + c and solve for c: -2 = 6 + c **M1**

(b) y = x - 8 cao **A1**

(b) Answer: y = x - 8

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