2.16 Straight Line Graphs: y = mx + c: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Work out the gradient of the straight line through (2, 4) and (4, 10).

(2)

2 Find the equation of the line that is parallel to y = -2x + 6 and passes through (3, -8).

(3)

3 A straight line has gradient 8 and passes through the point (5, 36). Find the equation of the line.

(3)

4 The taxi fare is given by the straight line graph with equation C = 23 + 9d, where the variable counts miles.
Write down the y-intercept and say what it represents.

(2)

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5 Complete a table of values for y = -x - 6 for x = 0, x = 3 and x = 4.

(2)

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6 The point (k, 3) lies on the line y = 3x. Find the value of k.

(2)

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7 Find the equation of the line that is parallel to y = -2x - 6 and passes through (0, -2).

(3)

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8 A straight line has gradient -3 and crosses the y-axis at (0, 8). Write down the equation of the line.

(2)

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9 A straight line has equation y = x - 5.
Write down (a) the gradient (b) the y-intercept.

(2)

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10 The height of a plant in cm is given by the straight line graph with equation h = 19 + 4t, where the variable counts weeks.
Write down the gradient of the line and say what it represents.

(2)

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11 Find the equation of the line that is parallel to y = -x + 4 and passes through (3, -10).

(3)

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12 A straight line has equation y = -8 + 2x.
Write down (a) the gradient (b) the y-intercept.

(2)

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13 The cost of hiring a van is given by C = 29 + 2d, where the variable counts days.
Work out the value of C for 6 days.

(2)

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14 A straight line has equation y = -5 + 3x.
Write down (a) the gradient (b) the y-intercept.

(2)

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15 A straight line passes through (4, 7) and (5, 10). Find the equation of the line.

(3)

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16 A straight line has equation $y = 7x + 9$.
Write down (a) the gradient (b) the y-intercept.

(2)

---

17 A straight line passes through (0, 5) and (2, 3). Find the equation of the line.

(3)

---

18 Find the coordinates of the points where the line $y = -x + 4$ crosses (a) the y-axis (b) the x-axis.

(1)

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19 Complete a table of values for $y = -2x + 2$ for $x = -3$, $x = 1$ and $x = 4$.

(2)

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20 The point (k, 13) lies on the line $y = 3x + 4$. Find the value of k.

(2)

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21 Complete a table of values for y = x - 2 for x = -2, x = -1 and x = 2.

(2)

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22 The point (k, -2) lies on the line y = 5x + 3. Find the value of k.

(2)

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23 Complete a table of values for y = -3x + 1 for x = -3, x = -2 and x = -1.

(2)

---

24 Find the coordinates of the points where the line y = 4x + 16 crosses (a) the y-axis (b) the x-axis.

(2)

---

25 Complete a table of values for y = -5x + 2 for x = -1, x = 1 and x = 2.

(2)

---

26 Work out the gradient of the straight line through (-3, 15) and (0, 3).

(2)

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27 Complete a table of values for y = x - 5 for x = 0, x = 3 and x = 5.

(2)

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28 Work out the gradient of the straight line through (-1, 0) and (0, 4).

(2)

---

29 Complete a table of values for y = -x - 1 for x = -3, x = -2 and x = 3.

(2)

---

30 Find the coordinates of the points where the line y = -4x - 12 crosses (a) the y-axis (b) the x-axis.

(2)

---

31 A straight line has gradient 2 and passes through the point (3, 0). Find the equation of the line.

(3)

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32 Find the coordinates of the points where the line y = 5x + 10 crosses (a) the y-axis (b) the x-axis.

(2)

---

33 The line y = mx + 2 passes through the point (4, 10). Find the value of m.

(2)

---

34 A straight line passes through points A(-2, 1) and B(2, 9). Work out the equation of the line in the form y = mx + c.

(3)

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35 A line has equation y = x/2 - 1. State the gradient and the y-intercept.

(1)

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36 Line L1 has equation y = 4x - 3. Line L2 passes through the point (0, 5) and is parallel to L1. Find the equation of L2.

(3)

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37 A line has gradient -3 and passes through the point (2, 1). Find the equation of the line in the form y = mx + c, then find the value of y when x = -1.

(3)

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38 A line crosses the x-axis at (5, 0) and has gradient 2. Find the equation of the line in the form y = mx + c, then state where it crosses the y-axis.

(3)

---

39 Two points lie on a line: (-3, 4) and (1, -8). Find the equation of the line in the form y = mx + c.

(3)

---

40 The line y = 0.25x + 6 is drawn. What is the y-intercept? Give your answer as a coordinate point.

(1)

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41 The line y = mx + 2 passes through the point (2, 10). Find the value of m.

(2)

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42 A line through (0, -5) and (4, 3) is drawn. Find its equation in the form y = mx + c.

(3)

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Mark scheme · 2.16 Straight Line Graphs: y = mx + c: 2-hour Pack

Question 1

(10 - (4))/(4 - (2)) or equivalent	M1
3 cao	A1

Answer: **3**

Question 2

gradient -2 used	M1
substitutes the point to find c	M1
y = -2x - 2 cao	A1

Answer: **y = -2x - 2**

Question 3

y = 8x + c with (5, 36) substituted	M1
c = -4 found	M1
y = 8x - 4 cao	A1

Answer: **y = 8x - 4**

Question 4

y-intercept = 23	B1
the starting value when there are 0 miles	B1

Answer: **23; it is the starting value when there are 0 miles**

Question 5

at least one value of y correct	M1
all three values correct	A1

Answer: **x = 0: y = -6, x = 3: y = -9, x = 4: y = -10**

Question 6

3 = 3k (or equivalent)	M1
1 cao	A1

Answer: **1**

Question 7

gradient -2 used	M1
substitutes the point to find c	M1
y = -2x - 2 cao	A1

Answer: **y = -2x - 2**

Question 8

y = mx + c with the gradient or intercept correct	M1
y = -3x + 8 cao	A1

Answer: **y = -3x + 8**

Question 9

(a) 1	B1
(b) -5	B1

Answer: **(a) 1, (b) -5**

Question 10

gradient = 4	B1
4 cm added for each extra week	B1

Answer: **4; it is the amount added for each extra week**

Question 11

gradient -1 used	M1
substitutes the point to find c	M1
y = -x - 7 cao	A1

Answer: **y = -x - 7**

Question 12

(a) 2	B1
(b) -8	B1

Answer: **(a) 2, (b) -8**

Question 13

substitutes 6	M1
41 cao	A1

Answer: **41**

Question 14

(a) 3	B1
(b) -5	B1

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

Question 15

gradient found	M1
substitutes a point to find c	M1
y = 3x - 5 cao	A1

Answer: **y = 3x - 5**

Question 16

(a) 7	B1
(b) 9	B1

Answer: **(a) 7, (b) 9**

Question 17

gradient found	M1
substitutes a point to find c	M1
y = -x + 5 cao	A1

Answer: **y = -x + 5**

Question 18

(b) (4, 0)	B1

Answer: **(a) (0, 4), (b) (4, 0)**

Question 19

at least one value of y correct	M1
all three values correct	A1

Answer: **x = -3: y = 8, x = 1: y = 0, x = 4: y = -6**

Question 20

13 = 3k + 4 (or equivalent)	M1
3 cao	A1

Answer: **3**

Question 21

at least one value of y correct	M1
all three values correct	A1

Answer: **x = -2: y = -4, x = -1: y = -3, x = 2: y = 0**

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Question 22

-2 = 5k + 3 (or equivalent) **M1**
-1 cao **A1**
Answer: **-1**

Question 23

at least one value of y correct **M1**
all three values correct **A1**
Answer: **x = -3: y = 10, x = -2: y = 7, x = -1: y = 4**

Question 24

(a) (0, 16) **B1**
(b) (-4, 0) **B1**
Answer: **(a) (0, 16), (b) (-4, 0)**

Question 25

at least one value of y correct **M1**
all three values correct **A1**
Answer: **x = -1: y = 7, x = 1: y = -3, x = 2: y = -8**

Question 26

(3 - (15))/(0 - (-3)) or equivalent **M1**
-4 cao **A1**
Answer: **-4**

Question 27

at least one value of y correct **M1**
all three values correct **A1**
Answer: **x = 0: y = -5, x = 3: y = -2, x = 5: y = 0**

Question 28

(4 - (0))/(0 - (-1)) or equivalent **M1**
4 cao **A1**
Answer: **4**

Question 29

at least one value of y correct **M1**
all three values correct **A1**
Answer: **x = -3: y = 2, x = -2: y = 1, x = 3: y = -4**

Question 30

(a) (0, -12) **B1**
(b) (-3, 0) **B1**
Answer: **(a) (0, -12), (b) (-3, 0)**

Question 31

y = 2x + c with (3, 0) substituted **M1**
c = -6 found **M1**
y = 2x - 6 cao **A1**
Answer: **y = 2x - 6**

Question 32

(a) (0, 10) **B1**
(b) (-2, 0) **B1**
Answer: **(a) (0, 10), (b) (-2, 0)**

Question 33

Substitute x=4, y=10 into y = mx + 2 leading to 10 = 4m + 2 or equivalent **M1**
m = 2 cao **A1**
Answer: **2**

Question 34

correct gradient method, e.g. (9 - 1) / (2 - (-2)) **M1**
substitutes a point to find c, e.g. 1 = 2(-2) + c **M1**
y = 2x + 5 cao **A1**
Answer: **y = 2x + 5**

Question 35

gradient 1/2, y-intercept (0, -1) **B1**
Answer: **gradient = 1/2, y-intercept = (0, -1)**

Question 36

identifies that parallel lines share gradient 4 **M1**
uses the point (0, 5) to find c = 5 **M1**
y = 4x + 5 cao **A1**
Answer: **y = 4x + 5**

Question 37

substitutes (2, 1) into y = -3x + c to find c = 7 **M1**
y = -3x + 7 cao **A1**
y = 10 when x = -1 (ft their equation) **B1**
Answer: **y = -3x + 7; y = 10 when x = -1**

Question 38

substitutes (5, 0) into y = 2x + c to find c = -10 **M1**
y = 2x - 10 cao **A1**
y-intercept (0, -10) (ft their equation) **B1**
Answer: **y = 2x - 10; y-intercept (0, -10)**

Question 39

correct gradient method, gradient = -3 **M1**
substitutes a point to find c, e.g. -8 = -3(1) + c **M1**
y = -3x - 5 cao **A1**
Answer: **y = -3x - 5**

Question 40

(0, 6) cao **B1**
Answer: **(0, 6)**

Question 41

substitutes (2, 10) into y = mx + 2 **M1**
m = 4 cao **A1**
Answer: **m = 4**

Question 42

correct gradient method, e.g. (3 - (-5)) / (4 - 0) **M1**
gradient = 2 **A1**
y = 2x - 5 cao (using the y-intercept given by (0, -5)) **A1**
Answer: **y = 2x - 5**

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