

Name _____

Date _____

11.2 Straight-line graphs — worksheet

Plot and read straight-line graphs, and connect the rule $y = mx + c$ to the gradient and the y-intercept. · 58 questions · Show your working.

Remember

- A straight line has the rule **$y = mx + c$** .
- **m is the gradient**: how much y changes for every 1 that x increases.
- **c is the y-intercept**: where the line crosses the y-axis, found by putting $x = 0$.
- To plot a line: make a small table of values, plot the points, then join them with a ruler.
- Two points fix a line, but always plot a **third as a check**.
- A **negative** gradient means the line goes down from left to right.
- **$y = 4$** is horizontal; **$x = -2$** is vertical. Neither is of the form $y = mx + c$.
- Lines with the same gradient are **parallel** and never meet.

A · Fluency — Substitute, and read off the graph.

- 1 For the line **$y = x$** , what is y when $x = 2$?

- 2 For the line **$y = x$** , what is y when $x = -2$?

- 3 For the line **$y = 2x$** , what is y when $x = 2$?

- 4 For the line **$y = 2x$** , what is y when $x = -2$?

- 5 For the line **$y = x + 2$** , what is y when $x = 2$?

- 6 For the line **$y = x + 2$** , what is y when $x = -2$?

- 7 For the line **$y = 2x + 1$** , what is y when $x = 2$?

- 8 For the line **$y = 2x + 1$** , what is y when $x = -2$?

- 9 For the line **$y = 3x - 1$** , what is y when $x = 2$?

- 10 For the line **$y = x - 3$** , what is y when $x = 2$?

- 11 For the line **$y = x - 3$** , what is y when $x = -2$?

- 12 For the line **$y = 2x - 2$** , what is y when $x = 2$?

13 For the line $y = -x$, what is y when $x = 2$?

14 For the line $y = -x$, what is y when $x = -2$?

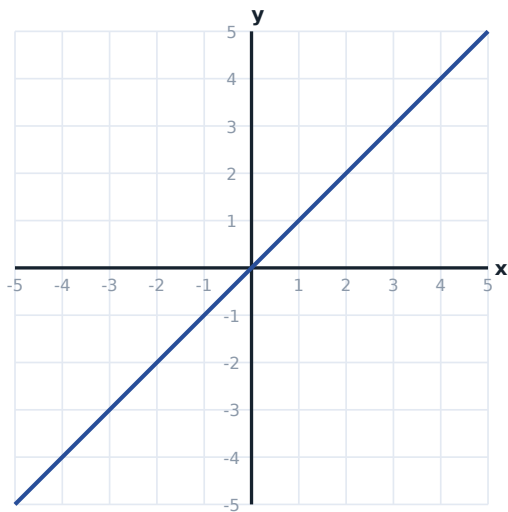
15 For the line $y = -2x + 1$, what is y when $x = 2$?

16 For the line $y = -2x + 1$, what is y when $x = -2$?

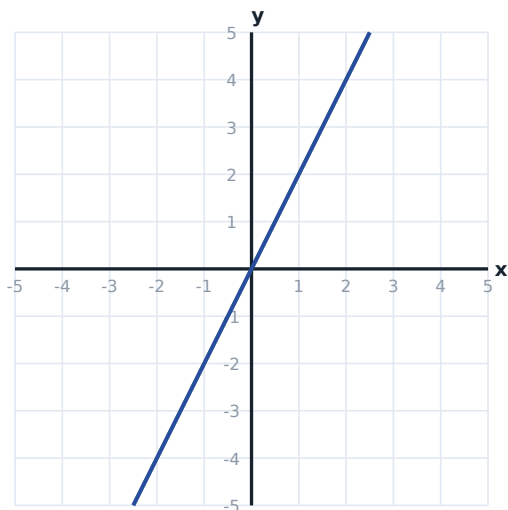
17 For the line $y = -x + 3$, what is y when $x = 2$?

18 For the line $y = -x + 3$, what is y when $x = -2$?

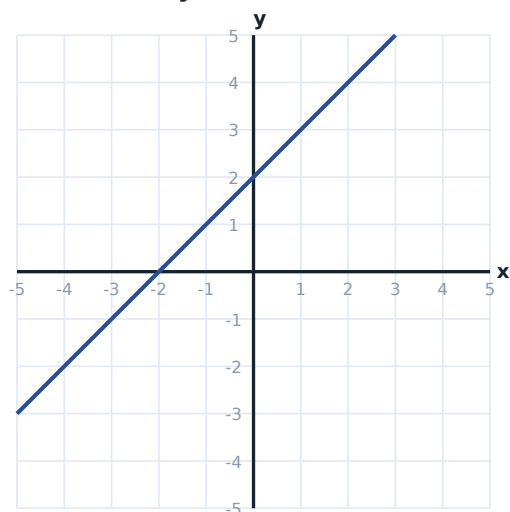
19 This is the line $y = x$. Where does it cross the y -axis? Give the y -coordinate.



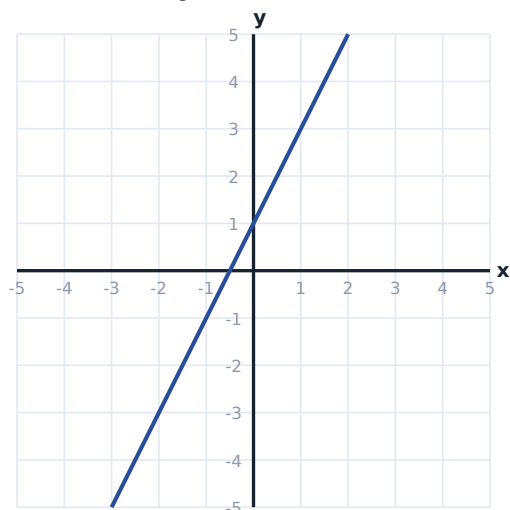
20 This is the line $y = 2x$. Where does it cross the y -axis? Give the y -coordinate.



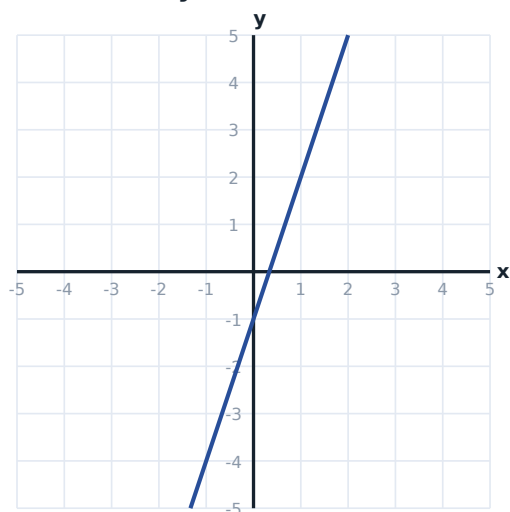
- 21** This is the line $y = x + 2$. Where does it cross the y-axis? Give the y-coordinate.



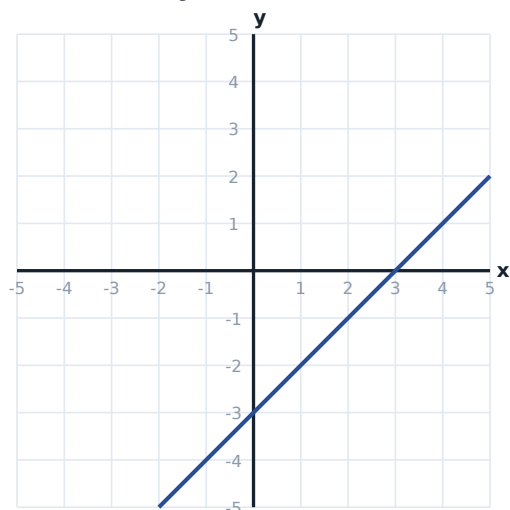
- 22** This is the line $y = 2x + 1$. Where does it cross the y-axis? Give the y-coordinate.



- 23** This is the line $y = 3x - 1$. Where does it cross the y-axis? Give the y-coordinate.



- 24** This is the line $y = x - 3$. Where does it cross the y-axis? Give the y-coordinate.



- 25** For the line $y = x$, how much does y go up each time x goes up by 1?
- 26** For the line $y = 2x$, how much does y go up each time x goes up by 1?
- 27** For the line $y = x + 2$, how much does y go up each time x goes up by 1?
- 28** For the line $y = 2x + 1$, how much does y go up each time x goes up by 1?
- 29** For the line $y = 3x - 1$, how much does y go up each time x goes up by 1?
- 30** For the line $y = x - 3$, how much does y go up each time x goes up by 1?
- 31** Does the point (3, 7) lie on the line $y = 2x + 1$? Answer 1 for yes, 0 for no.

- 32** Does the point (2, 6) lie on the line $y = 3x$? Answer 1 for yes, 0 for no.
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- 33** Does the point (1, 5) lie on the line $y = x + 4$? Answer 1 for yes, 0 for no.
-
- 34** Does the point (4, 5) lie on the line $y = 2x - 3$? Answer 1 for yes, 0 for no.
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- 35** Does the point (2, 3) lie on the line $y = -1x + 5$? Answer 1 for yes, 0 for no.
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B · Reasoning — What m and c mean.

- 36** In $y = 3x + 2$, what does the 3 tell you?
- ☐ Where the line crosses the y-axis
 - ☐ How steep the line is
 - ☐ The value of x
 - ☐ Nothing
- 37** In $y = 3x + 2$, what does the 2 tell you?
- ☐ The gradient
 - ☐ Where the line crosses the y-axis
 - ☐ The value of x
 - ☐ The number of points
- 38** How many points do you need to draw a straight line?
- ☐ One
 - ☐ Two, but three is safer
 - ☐ Ten
 - ☐ As many as possible
- 39** The line $y = 2x$ passes through which point?
- ☐ (0, 2)
 - ☐ (2, 0)
 - ☐ (0, 0)
 - ☐ (1, 1)
- 40** A line has a negative gradient. What does it look like?
- ☐ It goes up from left to right
 - ☐ It goes down from left to right
 - ☐ It is horizontal
 - ☐ It is vertical
- 41** What does the line $y = 4$ look like?
- ☐ Vertical
 - ☐ Horizontal, four units above the x-axis
 - ☐ Diagonal
 - ☐ Through the origin

- 42 What does the line $x = -2$ look like?
- ☐ Horizontal
 - ☐ Vertical, two units left of the y-axis
 - ☐ Diagonal
 - ☐ Through the origin
- 43 Do the lines $y = 2x + 1$ and $y = 2x + 5$ ever cross?
- ☐ Yes
 - ☐ No
- 44 How do you check whether a point lies on a line?
- ☐ Look at the graph only
 - ☐ Substitute its coordinates into the rule
 - ☐ Measure with a ruler
 - ☐ You cannot

C · Challenge — Missing coordinates and intercepts.

- 45 The line $y = 2x + 3$ passes through $(4, k)$. What is k ?
- _____
- 46 The line $y = 3x - 5$ passes through $(h, 7)$. What is h ?
- _____
- 47 Where does $y = 2x - 6$ cross the x-axis? Give the x-coordinate.
- _____
- 48 Two lines are $y = 3x + 1$ and $y = 3x + 7$. What is the vertical gap between them?
- _____
- 49 The line $y = mx$ passes through $(3, 12)$. What is m ?
- _____
- 50 The line $y = 2x + c$ passes through $(1, 5)$. What is c ?
- _____

D · Word problems — Fares, growth and burning candles.

- 51 A taxi charges $y = 2x + 3$ dollars for x km. What is the fare for 6 km, in dollars?
- _____
- 52 In that taxi rule, what does the 3 represent, in dollars?
- _____
- 53 A plant's height is $y = 3x + 5$ cm after x weeks. How tall at the start, in cm?
- _____
- 54 A plant's height is $y = 3x + 5$ cm after x weeks. How many cm does it grow each week?
- _____
- 55 A phone plan costs $y = 0.5x + 10$ dollars for x minutes. What is the cost of 40 minutes, in dollars?
- _____

56 A candle burns down: $y = 20 - 2x$ cm after x hours. How tall after 6 hours, in cm?

57 For that candle, after how many hours does it burn out?

58 A pool fills as $y = 15x$ litres after x minutes. How many litres after 8 minutes?
