Name:

Exam Style Questions

# Equation of a Line

Corbettmaths

Equipment needed: Ruler, calculator, pencil and pen

**Guidance**

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Video Tutorial

www.corbettmaths.com/contents

Videos 188, 191, 194, 195

Answers and Video Solutions

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

(a) Write down the gradient of the line

3

**(1)**

(b) Write down the y-intercept of the line

(0, 4) or 4

**(1)**

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2. Write down the gradient of the straight line with equation $y = 7x + 9$

7

**(1)**

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3. A straight line with equation $y = 4x + 2$

Write down the coordinates of the point where the line intersects the y-axis.

(0, 2)

**(1)**

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4. A straight line with equation $y = 2x - 5$ intersects the y-axis at the point D.

Write down the coordinates of the point D.

(0, -5)

**(1)**

5. Circle the equation that is **not** the equation of a straight line.

$y = x + 1$ $y = 9x - 2$

$y = x^2$ $y = 7 - 2x$

**(1)**

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6. A line has equation $y = -x + 5$

Write down the gradient of the line

$-1$

.....

**(1)**

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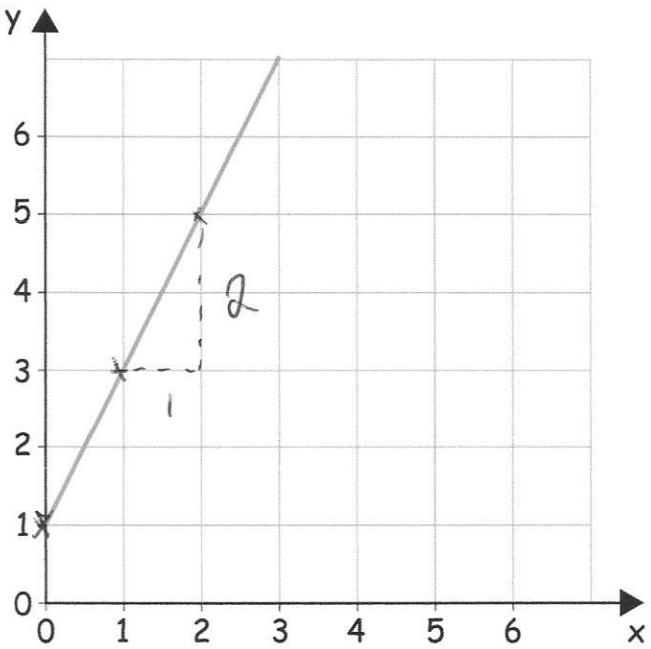
7. A straight line L is shown on the grid.




Work out the equation of line L

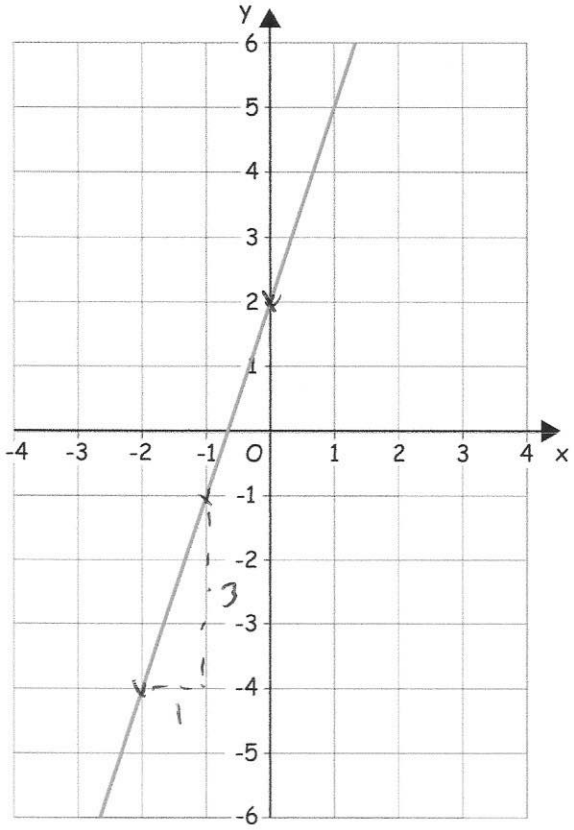
$m = \frac{2}{1} = 2$

$y = 2x + 1$

.....

**(3)**

8. A straight line is shown on the grid below.




(a) Write down the y-intercept.

(0, 2) or 2

**(1)**

(b) Find the gradient of the line.

$m = \frac{3}{1} = 3$

3

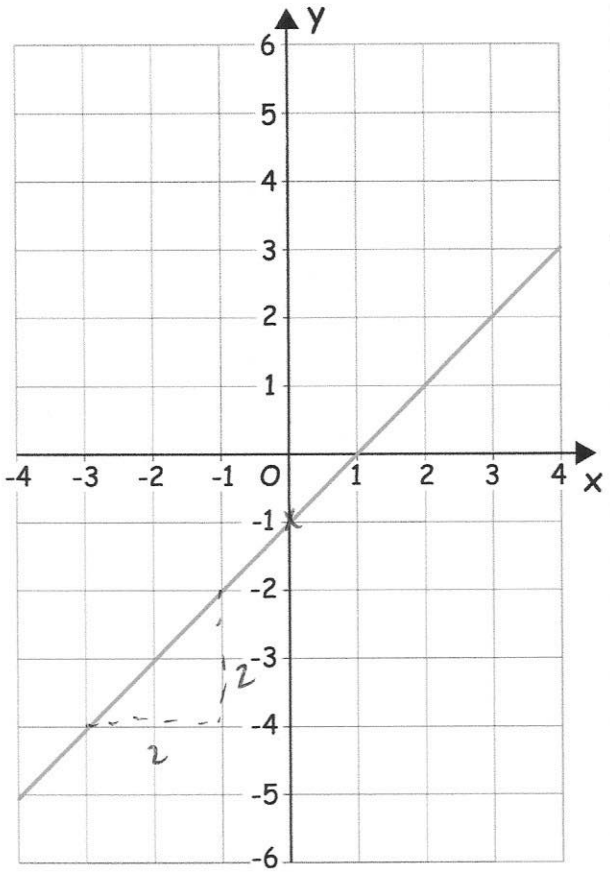
**(1)**

(c) Write down the equation of the line.

$y = 3x + 2$

**(1)**

9. A straight line L is shown on the grid.



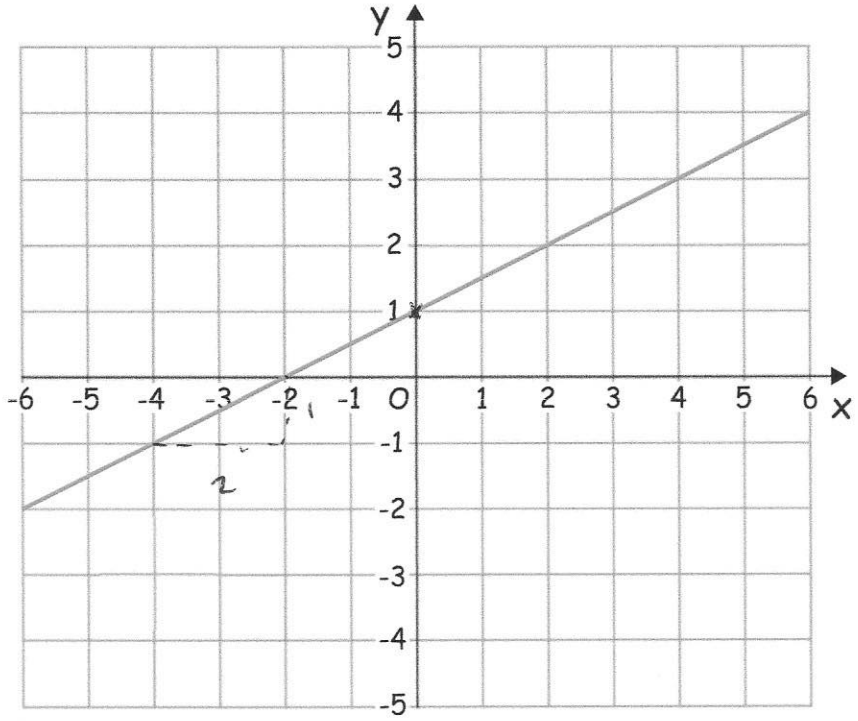

Work out the equation of line L

$m = \frac{2}{2} = 1$

$y = x - 1$

**(3)**

10. A straight line L is shown on the grid.



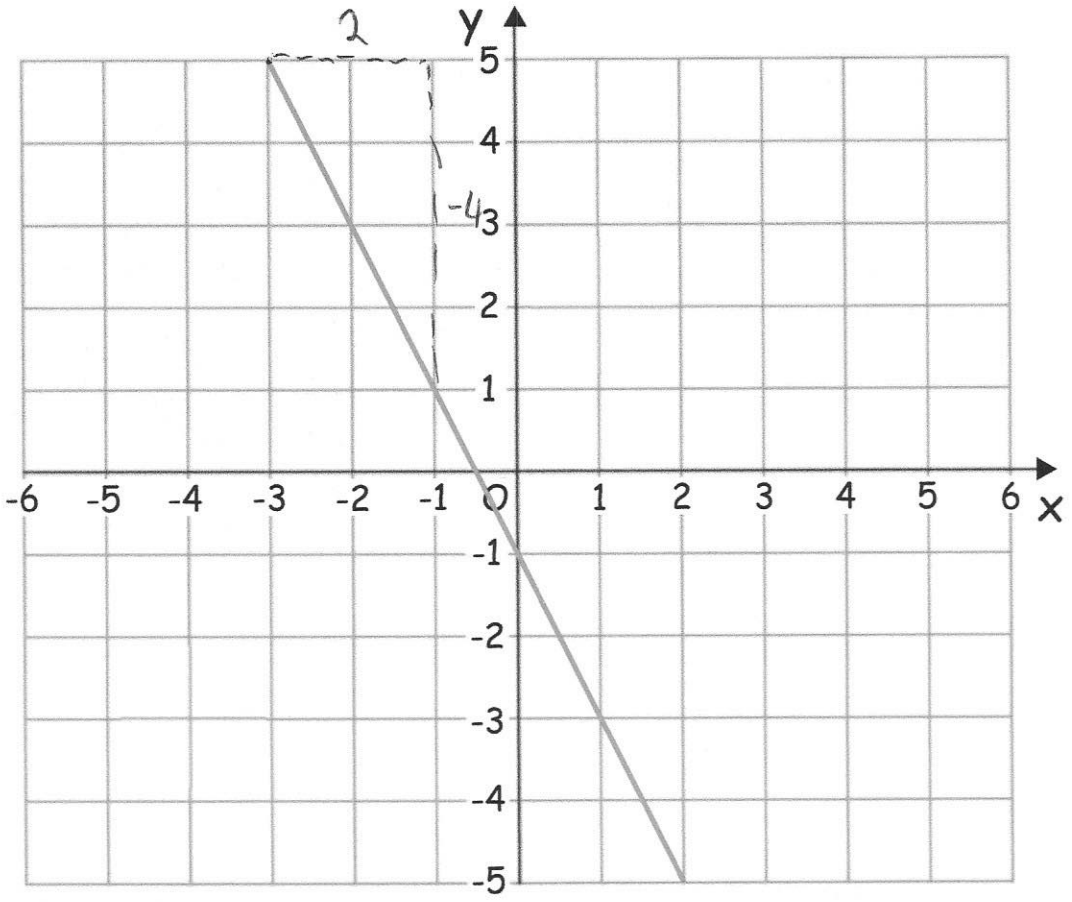

Work out the equation of line L

$m = \frac{1}{2}$

$y = \frac{1}{2}x + 1$

**(3)**

11. A straight line L is shown on the grid.



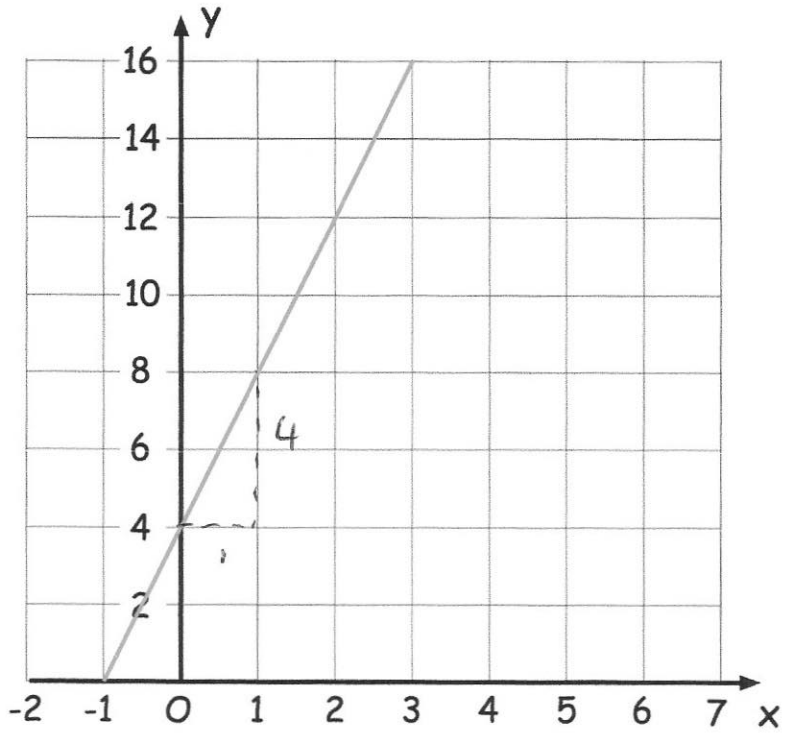

Work out the equation of line L

$m = \frac{-4}{2} = -2$

$y = -2x - 1$

**(3)**

12. A straight line L is shown on the grid.




Work out the equation of line L

$m = \frac{4}{1} = 4$

$y = 4x + 4$

**(3)**

13. A line has equation $y = 3 - 4x$

Write down the gradient of the line

$y = 3 - 4x$ ($m$)

or

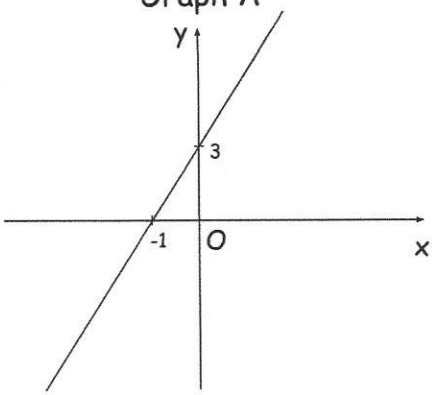
$y = -4x + 3$ ($m$)

$-4$

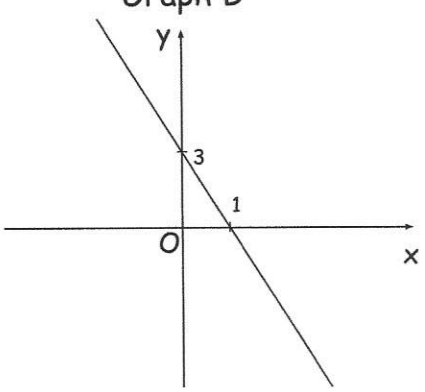
**(1)**

14. Shown below are four straight line graphs.

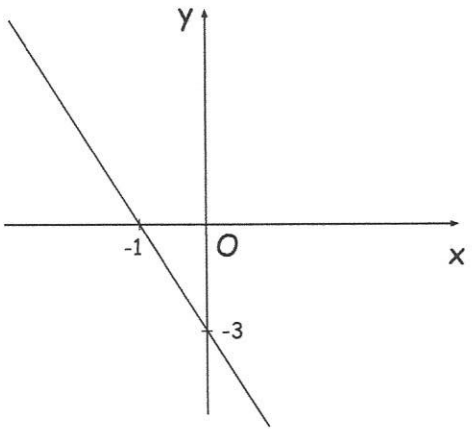
Graph A



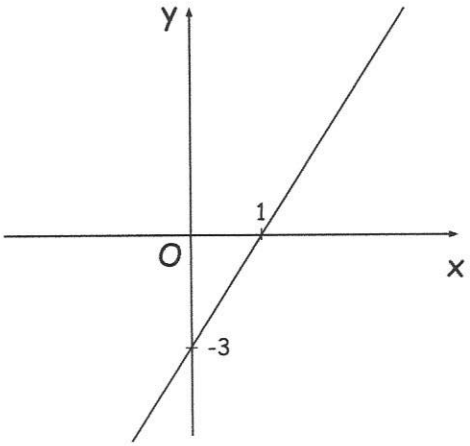

Graph B




Graph C




Graph D

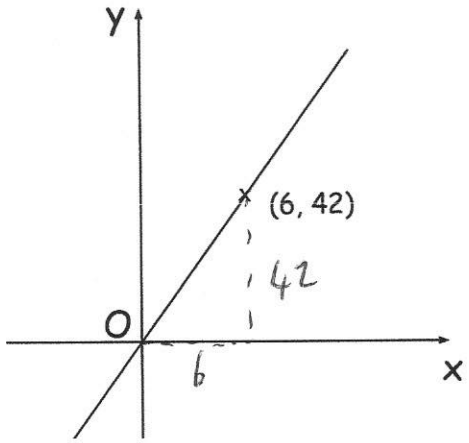



Match each equation to its graph.

| Equation | Graph |
|---|---|
| y = 3x + 3 | A |
| y = 3x - 3 | D |
| y = -3x + 3 | B |
| y = -3x - 3 | C |

**(2)**

15. A straight line is shown below.




Work out the equation of the line.

$m = \frac{42}{6}$

$= 7$

$y = 7x$

**(2)**

16. Work out the gradient of the line $y + 7x = 8$

$y = -7x + 8$

$-7$

**(2)**

17. A line has equation $3x + y = 15$

(a) Find the gradient of the line.

$y = -3x + 15$

$m = -3$

$-3$

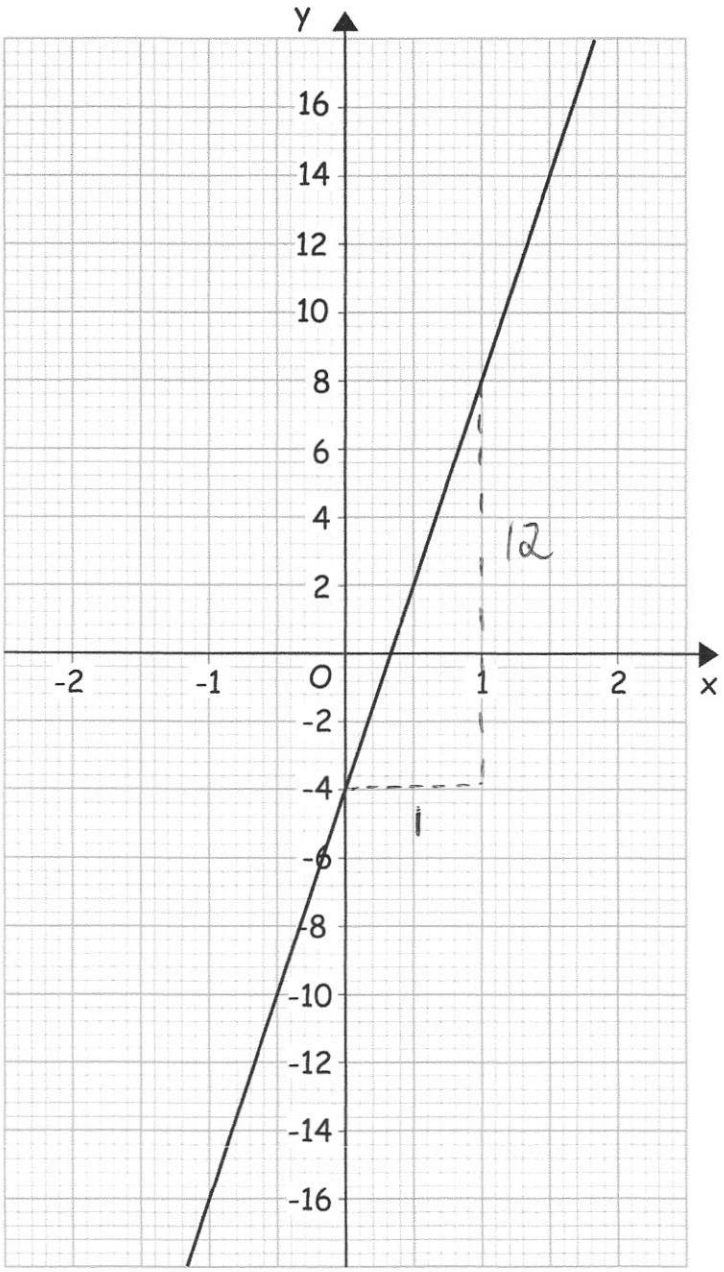
**(2)**

(b) Find where the line crosses the y-axis

$(0, 15)$

**(1)**

18. A straight line is shown on the grid.




Find the equation of the line.

$m = \frac{12}{1} = 12$

$y = 12x - 4$

**(3)**

19. A line has equation $y = -2x + 6$

(a) Write down the coordinates of the point where the line intersects the y-axis.

$x = 0$

$y = -2 \times 0 + 6$

$y = 6$

(0, 6)

**(1)**

(b) Write down the coordinates of the point where the line intersects the x-axis.

$y = 0$

$0 = -2x + 6$

$2x = 6$

$x = 3$

(3, 0)

**(1)**

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20. A line has equation $6x + 2y + 9 = 0$

(a) Find the gradient of the line.

$2y = -6x - 9$

$y = -3x - 4.5$

$-3$

**(2)**

(b) Find where the line crosses the y-axis

(0, -4.5)

**(1)**

21. The equations of four lines are given below.

| | |
|---|---|
| Line A | $y = 4x + 1$ |
| Line B | $y + 2x = 8$ |
| Line C | $y = 9 - 2x$ |
| Line D | $y - 3x = 3$ |

Which lines go through the point (2, 9)?

x y

Line A

$y = 4x + 1$

$9 = 4 \times 2 + 1$

$9 = 8 + 1$

$9 = 9$ ✓

Line B

$9 + 2 \times 2 = 8$

$9 + 4 = 8$

$13 = 8$ ✗

Line C

$9 = 9 - 2 \times 2$

$9 = 9 - 4$

$9 = 5$ ✗

Line D

$9 - 3 \times 2 = 3$

$9 - 6 = 3$

$3 = 3$ ✓

Line A & Line D

**(2)**

22. The line L passes through the points (0, 7) and (3, 19)

Work out the equation of the line L.

$m = \frac{19 - 7}{3 - 0}$

$= \frac{12}{3}$

$= 4$

$y = 4x + 7$

**(2)**

23. (a) Write down the gradient of the straight line with equation $y = 8x + 2$

8

**(1)**

The line cuts the y-axis at the point A

(b) Write down the coordinates of the point A.

$x = 0$

$y = 8 \times 0 + 2$

$= 0 + 2$

$= 2$

$(0, 2)$

**(1)**

The line cuts the x-axis at the point B

(c) Write down the coordinates of the point B.

$y = 0$

$0 = 8x + 2$

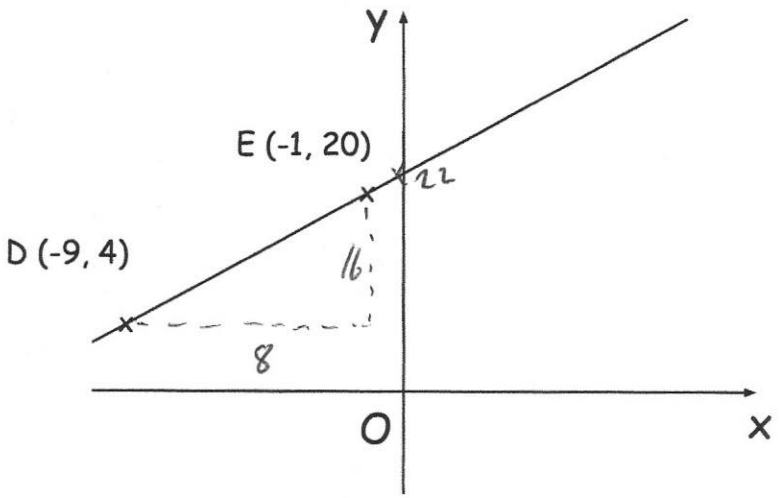
$8x = -2$

$x = -\frac{1}{4}$

$\left(-\frac{1}{4}, 0\right)$

**(2)**

24. A line passes through the points D $(-9, 4)$ and E $(-1, 20)$




(a) Find the gradient of the line.

$m = \frac{16}{8}$

$= 2$

2

**(2)**

(b) Find the equation of the line.

$y = 2x + c$

$20 = 2 \times (-1) + c$

$20 = -2 + c$

$c = 22$

$y = 2x + 22$

**(2)**

(c) Does the line pass through the point with coordinates $(12, 44)$ ?
Explain your answer.

x y

$y = 2x + 22$

$44 = 2 \times (12) + 22$

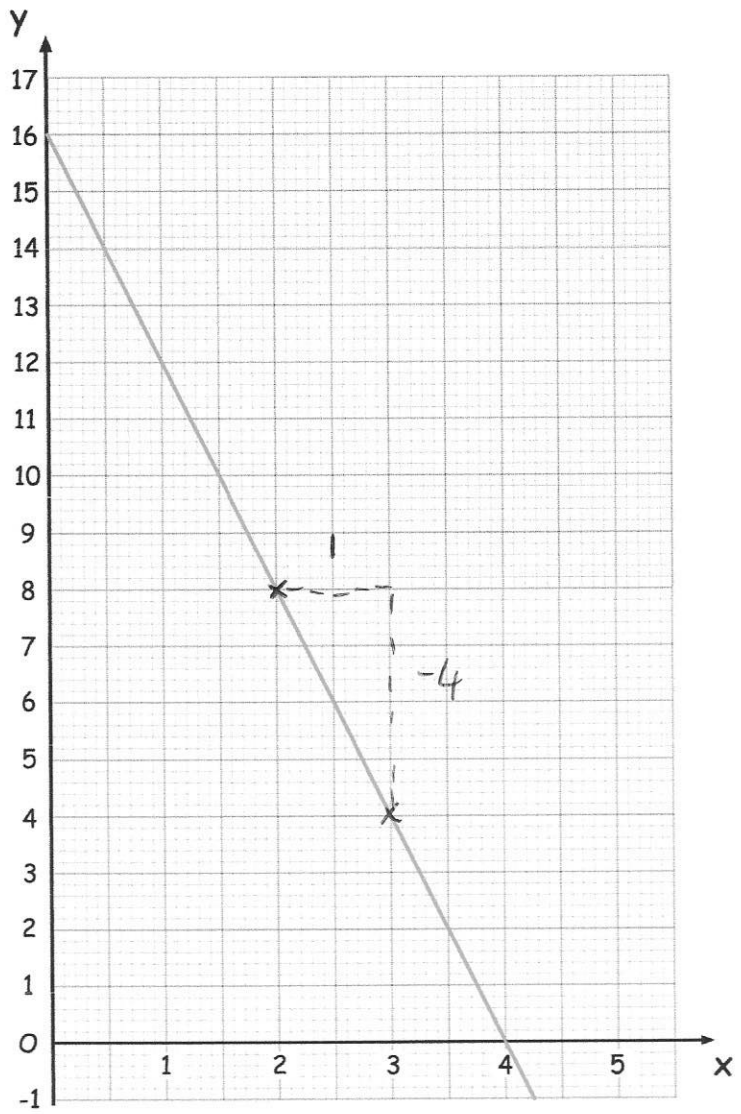
$44 = 24 + 22$

$44 = 46$ X

No, it does not

**(2)**

25.




(a) Find the equation of the line.

$m = \frac{-4}{1} = -4$

$y = -4x + 16$

.....

**(3)**

(b) Give the y-coordinate of the point on the line with an x-coordinate of 8

$y = -4 \times 8 + 16$

$= -32 + 16$

$= -16$

$-16$

.....

**(2)**

x y

26. Find the equation of the line that passes through the points (–3, 5) and (1, –15)

$m = \frac{-15-5}{1-(-3)}$

$= \frac{-20}{4}$

$= -5$

$y = -5x + c$

$-15 = -5 + c$

$-10 = c$

$y = -5x - 10$

**(3)**

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27. The point A (1, 1) and the point B (5, –1) lie on the line L.

x y

Find the equation of the line L.

$m = \frac{-1-1}{5-1}$

$= \frac{-2}{4} = -\frac{1}{2}$

$y = -\frac{1}{2}x + c$

$1 = -\frac{1}{2} + c$

$c = 1.5$

$y = -\frac{1}{2}x + 1.5$

$y = -\frac{1}{2}x + \frac{3}{2}$

**(3)**

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28. A line has a gradient of 8 and passes through the point (2, 3).

Find the equation of the line.

x y

$y = 8x + c$

$3 = 16 + c$

$c = -13$

$y = 8x - 13$

**(2)**

x y

29. A straight line passes through the point $(1, 3)$ and has gradient $-4$

Find the equation of the line.

$y = -4x + c$

$3 = -4 + c$

$c = 7$

$y = -4x + 7$

**(2)**

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30. A line has a gradient of $-\frac{1}{2}$ and passes through the point $(-6, -8)$

x y

Find the equation of the line.

$y = -\frac{1}{2}x + c$

$-8 = 3 + c$

$c = -11$

$y = -\frac{1}{2}x - 11$

**(3)**

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31. A line has a gradient of $-\frac{4}{5}$ and passes through the point $(30, 24)$

x y

Find the equation of the line.

$y = -\frac{4}{5}x + c$

$24 = -24 + c$

$c = 48$

$y = -\frac{4}{5}x + 48$

**(3)**

32. The line with equation $4x + 3y = 36$ crosses the y-axis at the point A.

The line with equation $y = \frac{2}{3}x - 12$ crosses the x-axis at the point B.

The point C is the midpoint of AB.

Find the coordinates of the point C.

$4x + 3y = 36$ $\quad x = 0$

$3y = 36$

$y = 12$

$A(0, 12)$

$y = \frac{2}{3}x - 12$ $\quad y = 0$

$0 = \frac{2}{3}x - 12$

$12 = \frac{2}{3}x$

$36 = 2x$

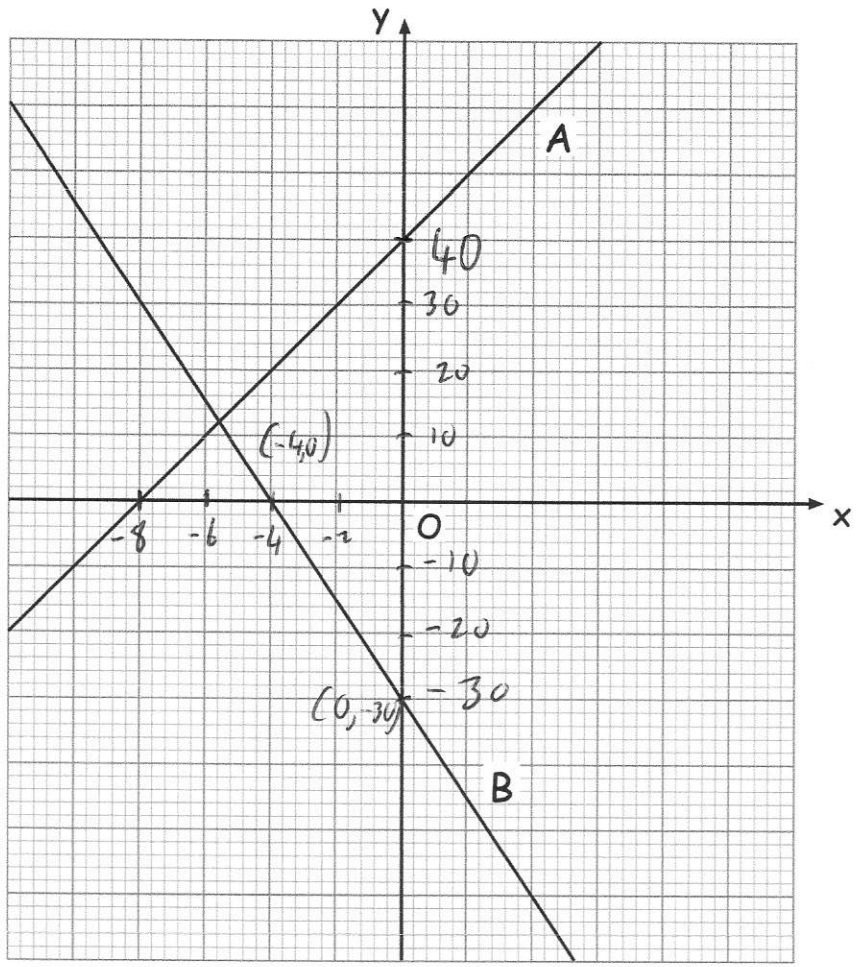
$x = 18$ $\quad B(18, 0)$

$(9, 6)$

.....

**(4)**

33. Lines A and B are shown on the grid.




The equation of line A is $y = 5x + 40$

Find the equation of line B

Line A

$0 = 5x + 40$

$5x = -40$

$x = -8$

$(-8, 0)$

Line B

$m = \frac{-30 - 0}{0 - -4}$

$= \frac{-30}{4}$

$= -7.5$

$y = -7.5x - 30$

**(5)**