

Name:

Exam Style Questions

Gradient



Corbettmaths

Equipment needed: Calculator, 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

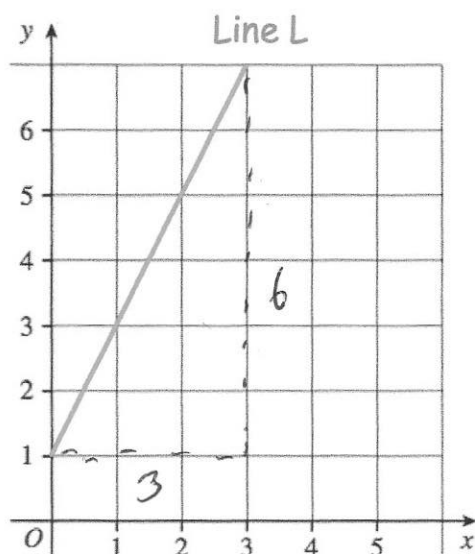
Videos 189, 190



Answers and Video Solutions



1.



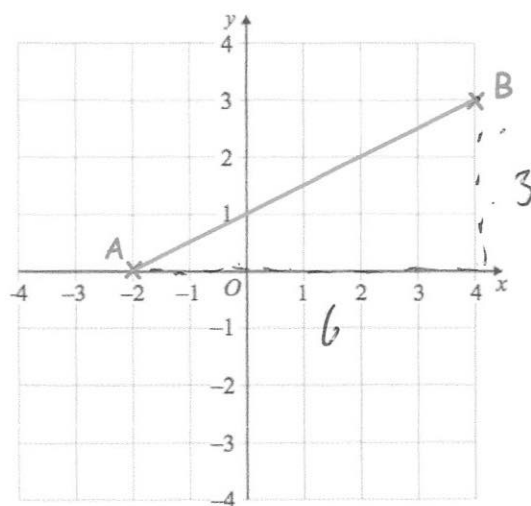
Line L is drawn on the grid.

Work out the gradient of Line L.

$$m = \frac{\text{rise}}{\text{run}} \\ = \frac{6}{3} = 2$$

.....
2
(2)

2.



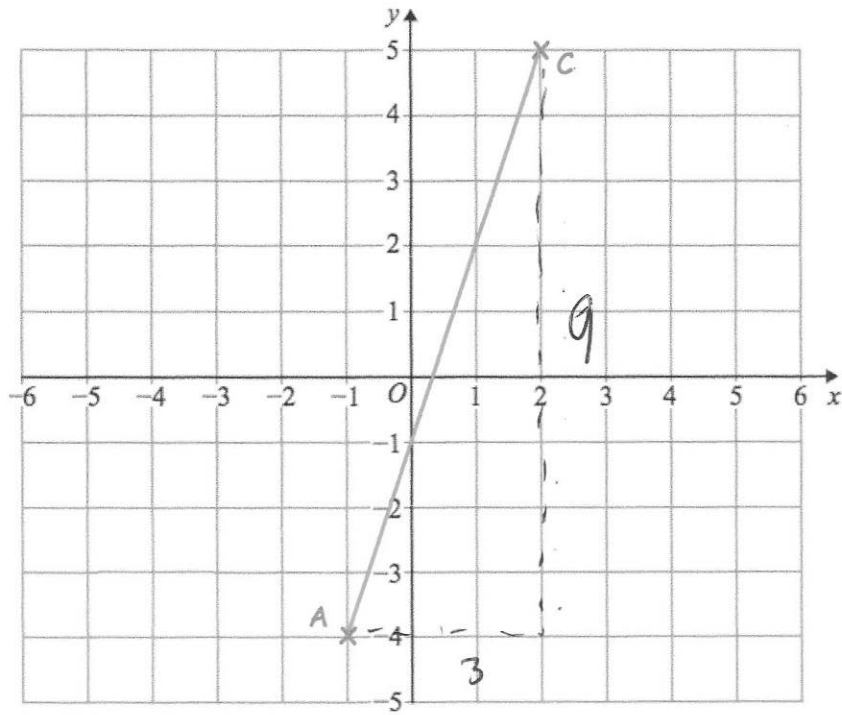
AB is drawn on the grid.

Work out the gradient of AB.

$$m = \frac{\text{rise}}{\text{run}} \\ = \frac{3}{6} \\ = \frac{1}{2}$$

.....
 $\frac{1}{2}$
(2)

3.



A is the point with coordinates $(-1, -4)$

C is the point with coordinates $(2, 5)$

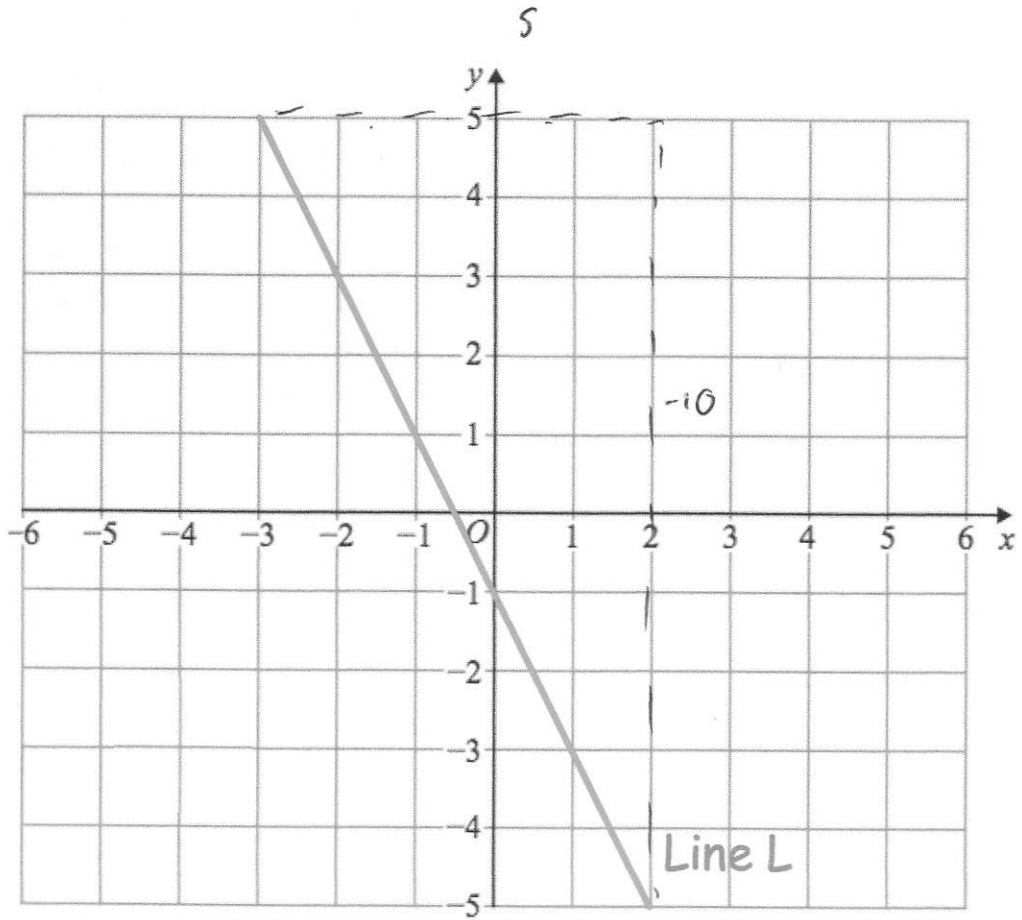
Find the gradient of the line AC.

$$\begin{aligned} m &= \frac{\text{rise}}{\text{run}} \\ &= \frac{9}{3} \\ &= 3 \end{aligned}$$

3

.....
(2)

4.



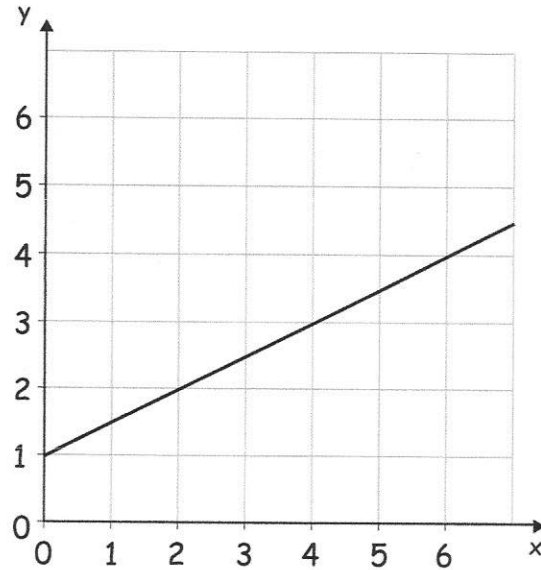
Line L is drawn on the grid.

Work out the gradient of Line L.

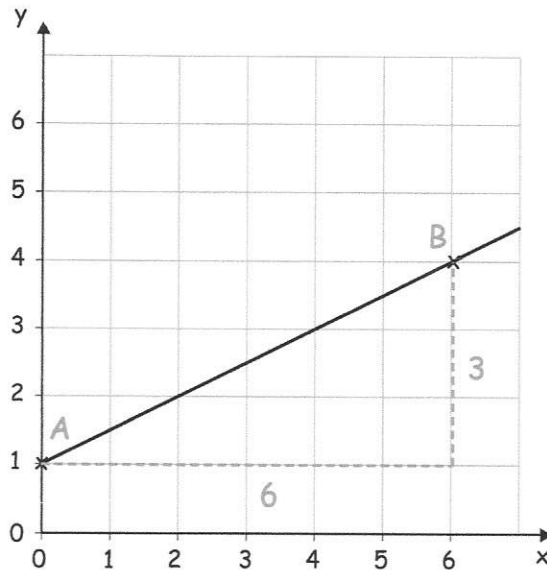
$$\begin{aligned} m &= \frac{\text{rise}}{\text{run}} \\ &= \frac{-10}{5} \\ &= -2 \end{aligned}$$

$$\frac{-2}{\dots\dots\dots} \quad (2)$$

5. Carolyn was asked to find the gradient of a straight line drawn on the below.



To find the gradient of the line, she chose two points A and B.



Carolyn says that the gradient is 2, as $6 \div 3 = 2$

Is Carolyn correct?
Explain your answer.

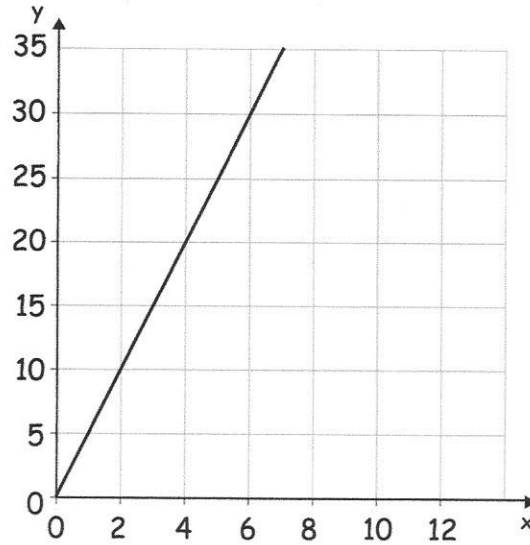
No. The gradient is found by "rise divided by run."
It should be $3 \div 6 = \frac{1}{2}$

(2)

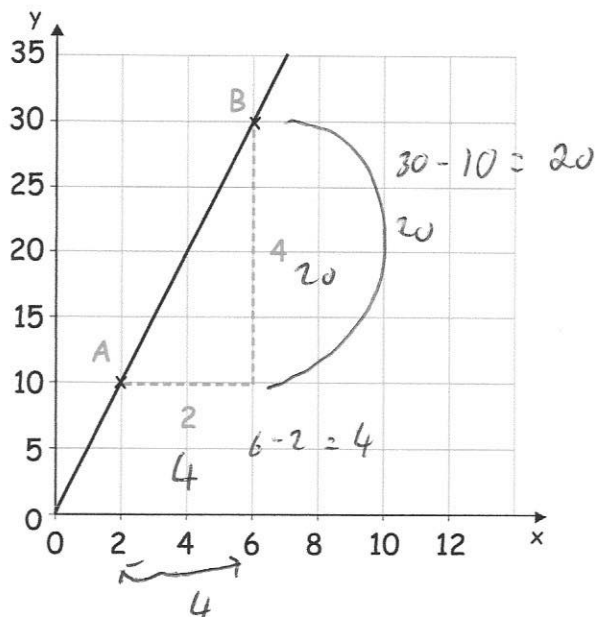
6.



George was asked to find the gradient of a straight line drawn on the below.



To find the gradient of the line, he chose two points A and B.



George says that the gradient is 2, as $4 \div 2 = 2$

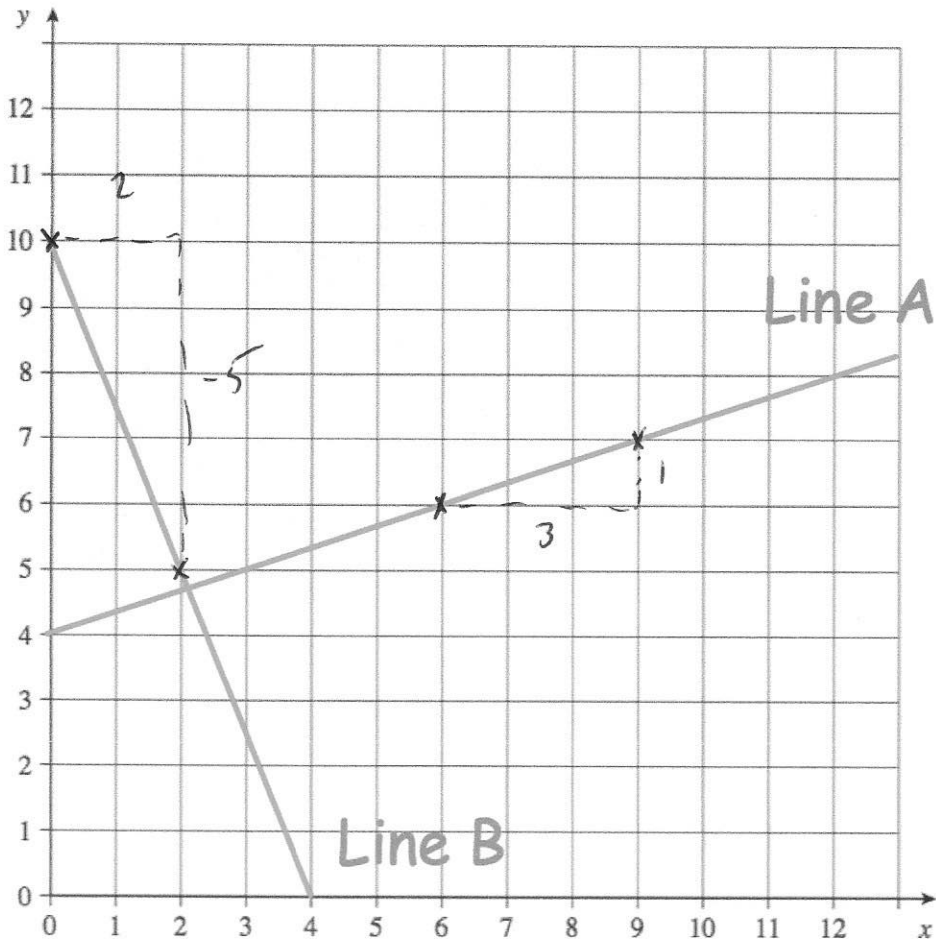
Explain why George is not correct.

The scale is not 1 unit for each square.

It should be $20 \div 4 = 5$

(2)

7.



- (a) Line A is drawn on the grid.
Work out the gradient of Line A.

$$m = \frac{\text{rise}}{\text{run}}$$

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

$$\frac{1}{3}$$

(2)

- (b) Line B is drawn on the grid.
Work out the gradient of Line B.

$$m = \frac{\text{rise}}{\text{run}}$$

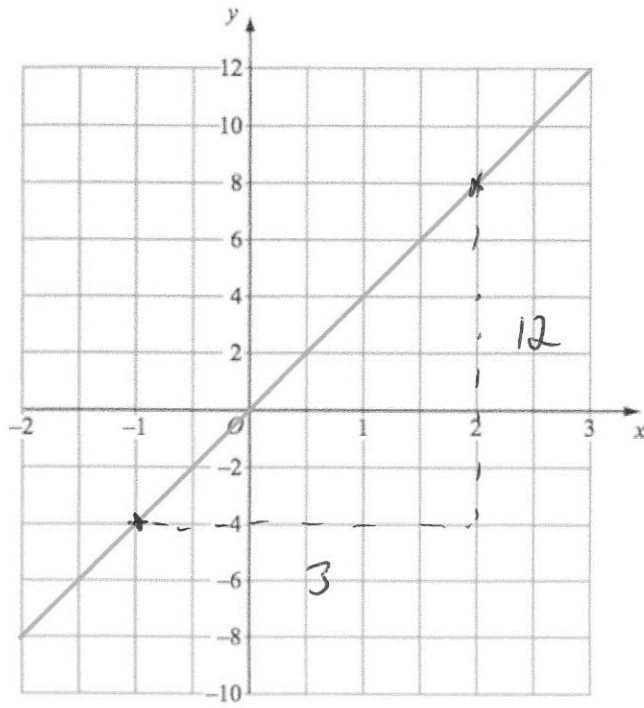
$$= \frac{-5}{2}$$

$$= -2.5$$

$$-2.5$$

(2)

8.

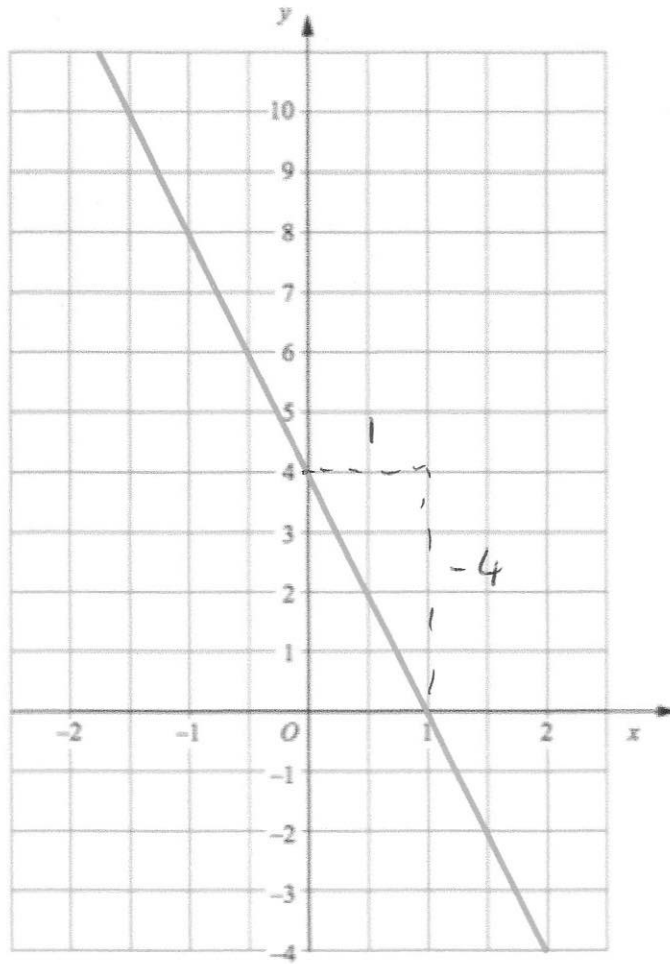


Work out the gradient of the line shown.

$$\begin{aligned} m &= \frac{\text{rise}}{\text{run}} \\ &= \frac{12}{3} \\ &= 4 \end{aligned}$$

$$\frac{4}{\dots\dots\dots} \quad (2)$$

9.

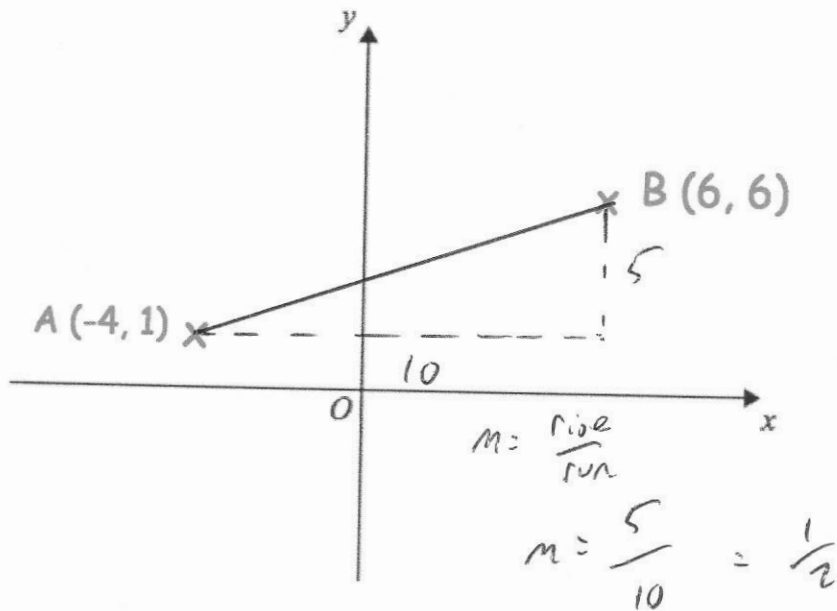


Work out the gradient of the line shown.

$$\begin{aligned} m &= \frac{\text{rise}}{\text{run}} \\ &= \frac{-4}{1} \\ &= -4 \end{aligned}$$

$$\frac{-4}{\dots\dots\dots} \quad (2)$$

10.



A is the point $(-4, 1)$

B is the point $(6, 6)$

Find the gradient of AB.

$$\begin{array}{cc} x_1 & y_1 \\ (-4, & 1) \end{array} \quad \text{or} \quad \begin{array}{cc} x_2 & y_2 \\ (6, & 6) \end{array}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{6 - 1}{6 - (-4)} = \frac{5}{10} = \frac{1}{2}$$

$$\frac{1}{2}$$

(2)

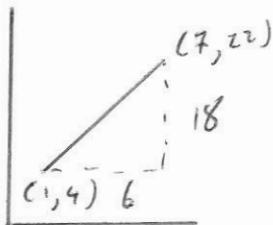
11.



A is the point with coordinates $(1, 4)$

B is the point with coordinates $(7, 22)$

Find the gradient of AB.



$$\frac{18}{6} = 3$$

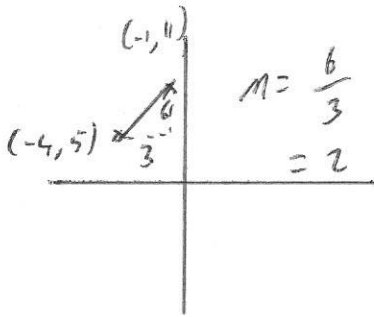
or

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{22 - 4}{7 - 1} = \frac{18}{6} = 3$$

$$3$$

(2)

12. Work out the gradient of the line passing through the points $(-4, 5)$ and $(-1, 11)$



or

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

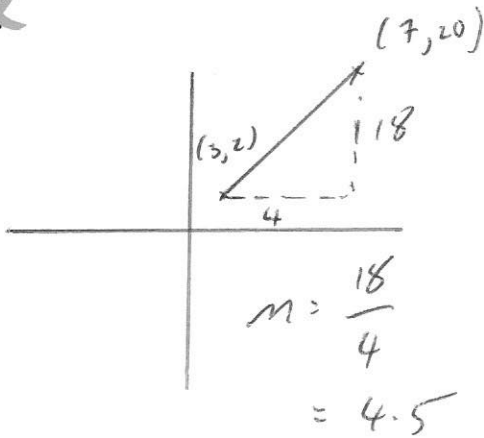
$$m = \frac{11 - 5}{-1 - (-4)}$$

$$= \frac{6}{3} = 2$$

2

(2)

13. Work out the gradient of the line passing through the points $(3, 2)$ and $(7, 20)$



or

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

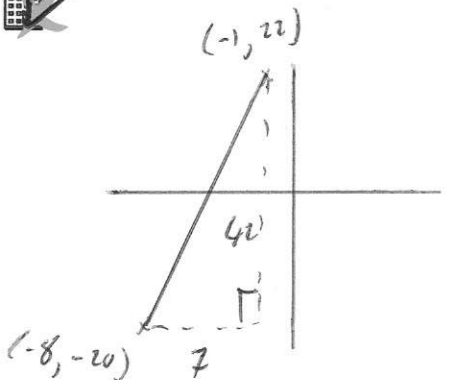
$$= \frac{20 - 2}{7 - 3}$$

$$= \frac{18}{4} = 4.5$$

4.5

(2)

14. Work out the gradient of the line passing through the points $(-8, -20)$ and $(-1, 22)$



or

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{22 - (-20)}{-1 - (-8)}$$

$$= \frac{42}{7} = 6$$

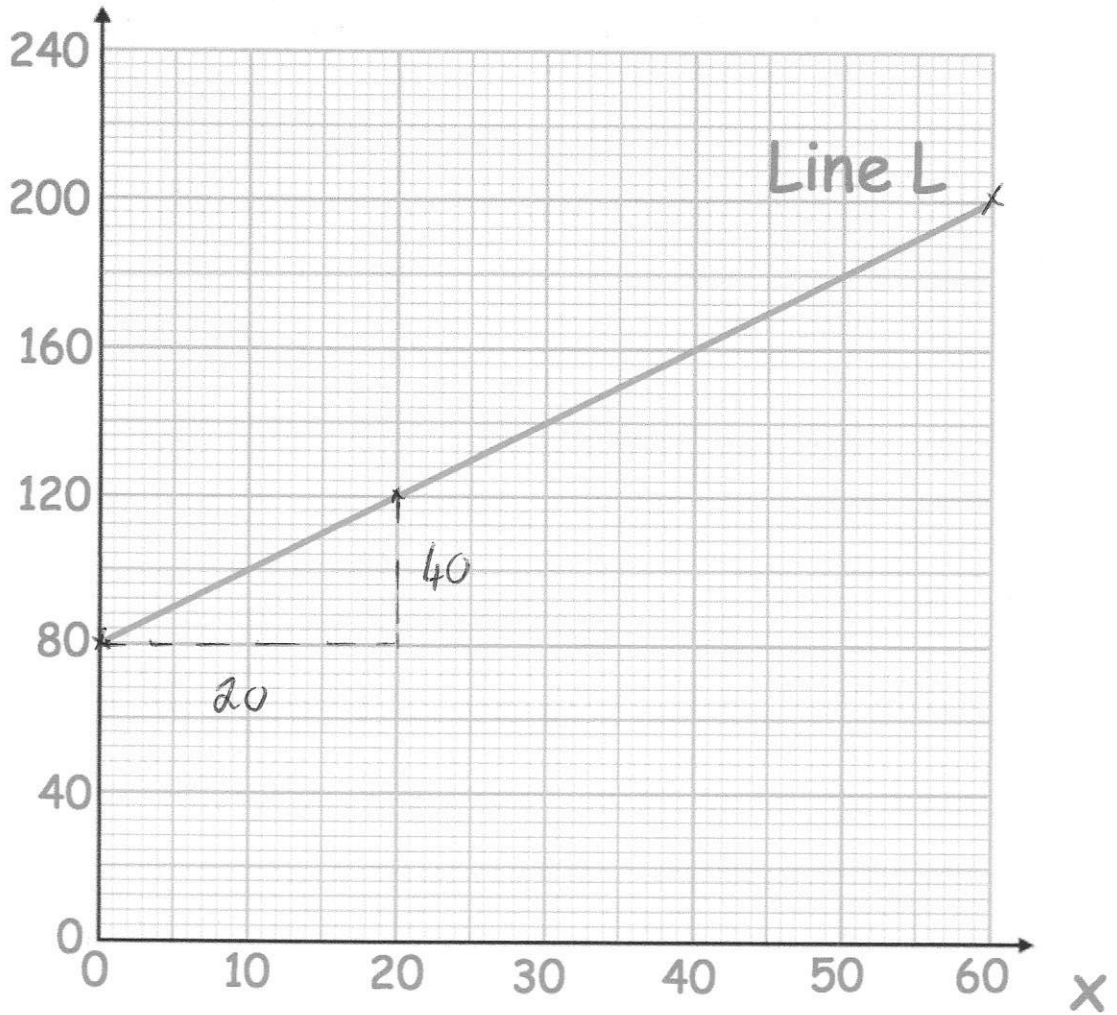
6

(2)

15.



Y



Line L is drawn on the grid.

Work out the gradient of Line L.

$$m = \frac{40}{20} = 2$$

2

.....
(2)

16. Work out the gradient of the line passing through the points (120, 1100) and (200, 3500)



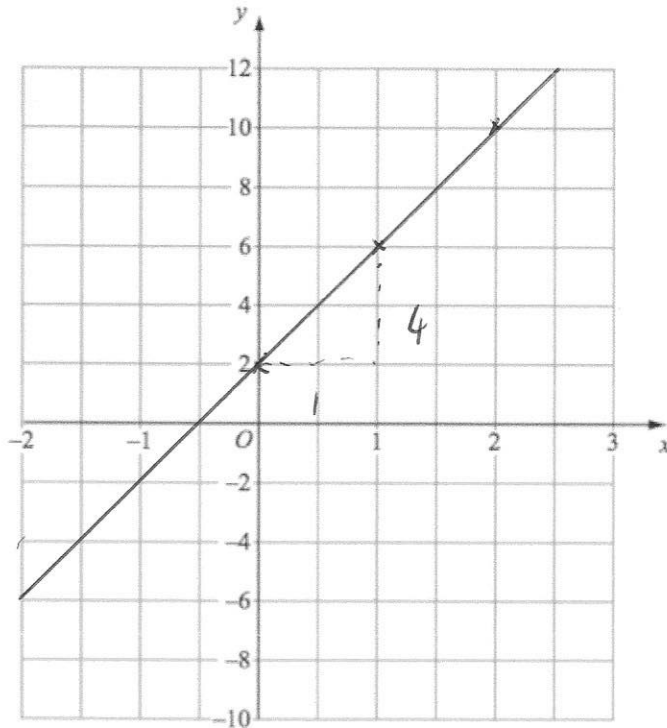
x_1 y_1
 x_2 y_2

$$m = \frac{3500 - 1100}{200 - 120}$$
$$= \frac{2400}{80} = 30$$

30

(2)

- 17.



- (a) Draw the graph $y = 4x + 2$ on the grid above.

| | | | |
|-----|---|---|----|
| x | 0 | 1 | 2 |
| y | 2 | 6 | 10 |

(2)

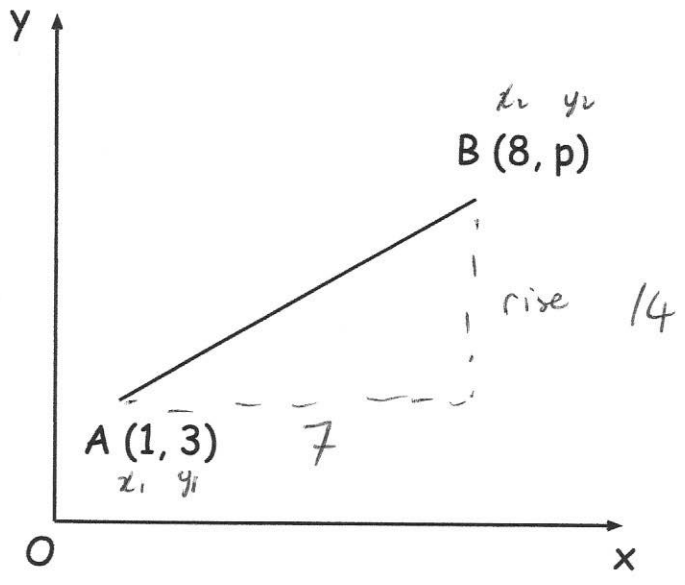
- (b) Write down the gradient of the line $y = 4x + 2$

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

4

(1)

19. The point A has coordinates (1, 3)
The point B has coordinates (8, p)



The gradient of the line AB is 2

Work out the value of p.

$$m = \frac{\text{rise}}{\text{run}}$$

$$2 = \frac{\text{rise}}{7}$$

$$\text{rise} = 14$$

or

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$2 = \frac{p - 3}{8 - 1}$$

$$2 = \frac{p - 3}{7}$$

$$14 = p - 3$$

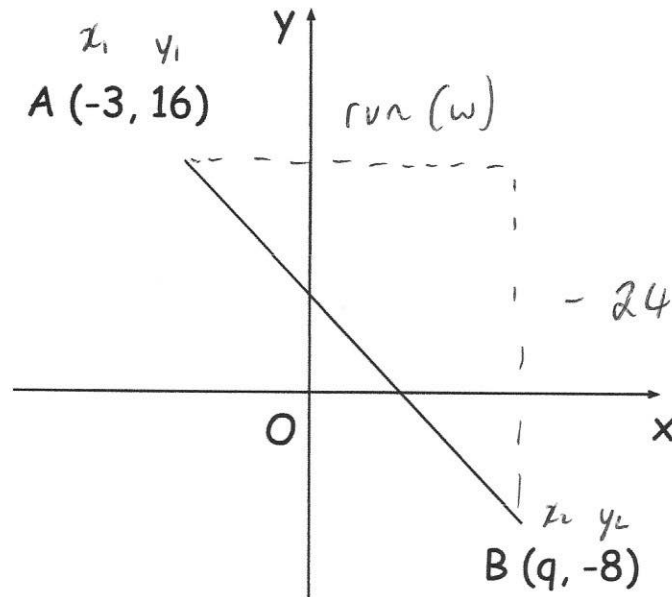
$$p = 17$$

$$3 + 14 = 17$$

17

(3)

20. The point A has coordinates $(-3, 16)$
 The point B has coordinates $(q, -8)$



The gradient of the line AB is -3

Work out the value of q .

$$m = \frac{\text{rise}}{\text{run}}$$

$$-3 = \frac{-24}{\text{run}}$$

$$-3w = -24$$

$$w = 8$$

$$-3 + 8 = 5$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$-3 = \frac{-8 - 16}{q - (-3)}$$

$$-3 = \frac{-24}{q + 3}$$

$$-3(q + 3) = -24$$

$$q + 3 = 8$$

$$q = 5$$

or

5

 (3)

21. The line passing through (x_1, y_1) and (x_2, y_2) has a gradient of 3



Find c .

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$3 = \frac{c - (-7)}{8 - 4}$$

$$3 = \frac{c + 7}{4}$$

$$12 = c + 7$$

$$c = 5$$

5

(3)

22. The line passing through (x_1, y_1) and (x_2, y_2) has a gradient of 2.



Find a .

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$2 = \frac{10 - (-4)}{a - 6}$$

$$2 = \frac{14}{a - 6}$$

$$2(a - 6) = 14$$

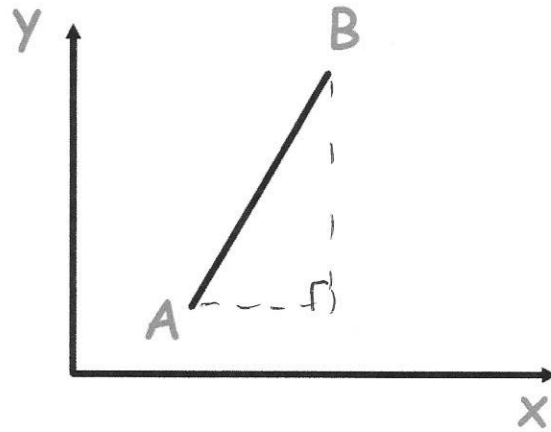
$$a - 6 = 7$$

$$a = 13$$

13

(3)

23.



x_1, y_1

A is the point (3, 1).

B is the point (a, 11).

x_2, y_2

The gradient of AB is $\frac{5}{2}$

Work out the value of a.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{5}{2} = \frac{11 - 1}{a - 3}$$

$$2.5 = \frac{10}{a - 3}$$

$$2.5(a - 3) = 10$$

$$a - 3 = 4$$

$$a = 7$$

7

(3)

24. The line passing through (x_1, y_1) and (x_2, y_2) has a gradient of $\frac{3}{4}$



Work out the value of a.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{3}{4} = \frac{1 - a}{8 - 4}$$

$$0.75 = \frac{1 - a}{4}$$

$$3 = 1 - a$$

$$a = -2$$

.....
-2

(3)

25. A straight line passes through the points (m, n) and (p, q)



Given that

$$p = m + 6$$

$$n = q - 18$$

Find the gradient of the line.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{q - (q - 18)}{(m + 6) - m}$$

$$= \frac{18}{6}$$

$$= 3$$

.....
3

(3)