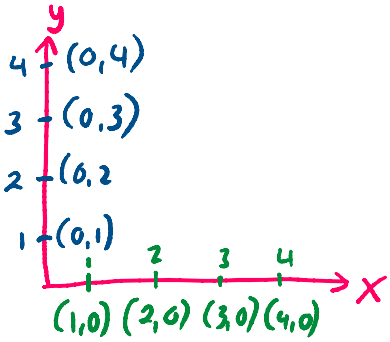


On the y axis
x is ALWAYS 0
$x=0$

On the x axis
y is ALWAYS 0
$y=0$

Eg 1 Graph the line $2x+y=6$

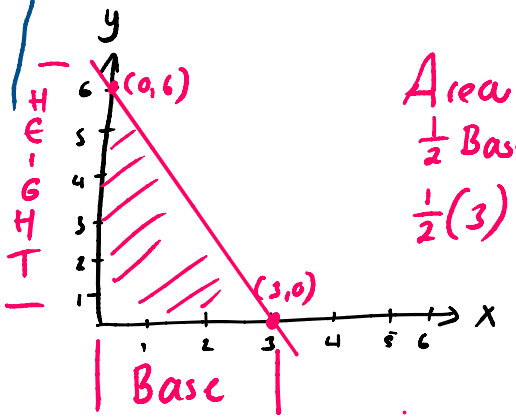
you need to find where the line cut the y axis ($x=0$) and x axis ($y=0$)

x axis
$y=0$ sub in 0 for y in the equation.

$2x+(0)=6$
$2x=6$
$\div 2 \quad x=3 \quad \div 2$
Point (3,0)

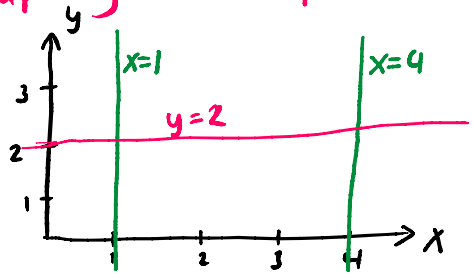
y axis
$x=0$ sub in 0 for x in the equation.

$2(0)+y=6$
$y=6$
Point (0,6)



Area of the Δ
$\frac{1}{2}$ Base x $\perp$ height
$\frac{1}{2}(3) \times 6 = 9 \text{ units}^2$

Graphing lines parallel to the axis



Lines // to the y axis
$x=a$, $a \in Z$

Lines // to the x axis
$y=a$, $a \in Z$

C/W → H/W Pg 222 Q1+2 Pg 223 Q4

T&T2 11.6 Graphing...

T&T2 11.6 Graphing...

Chapter 11

Coordinate Geometry – The Line

Section 11.6 Graphing lines

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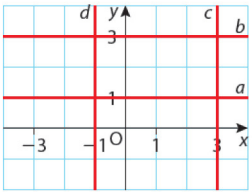
Example 1

If the point $(k, 3)$ is on the line $4x - 3y + 1 = 0$, find the value of k.

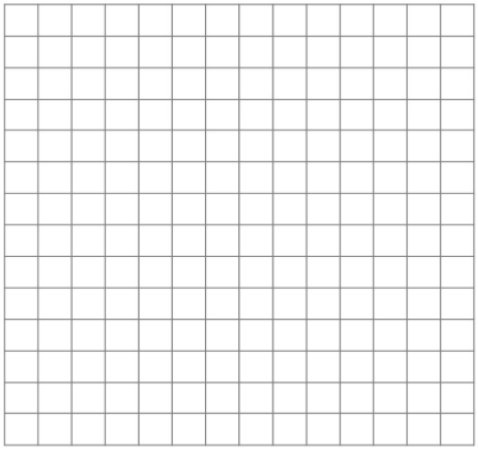
Exercise 11.6

1. Write down the equations of the lines a, b, c and d shown on the right.



2. Draw a pair of axes and sketch these four lines:

(i) $x = 4$ (ii) $y = 2$ (iii) $x = -2$ (iv) $y = -3$



3. Use the graph of the line $2x + y = 6$ to write down

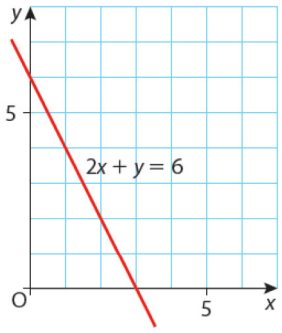
(i) the value of x when $y = 0$

(ii) the coordinates of the point where the line crosses the y-axis

(iii) the value of y when $x = 1$

(iv) the value of x when $y = 2$

(v) the area of the triangle formed by the line, the x-axis and the y-axis.



4. A straight line has equation $x + y = 5$.

(i) By substituting $x = 0$, find the coordinates of the point where the line crosses the y-axis.

(ii) By substituting $y = 0$, find the coordinates of the point where the line crosses the x-axis.

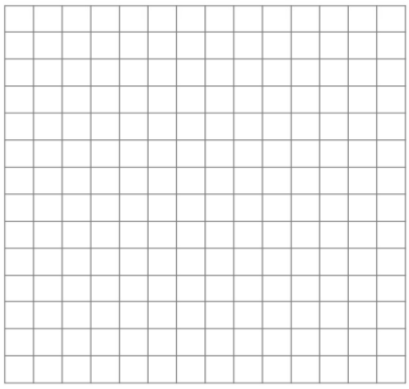
(iii) Draw a graph of the line $x + y = 5$.

5. A straight line has equation $3x + y = 6$.

(i) By substituting $x = 0$, find the coordinates of the point where the line crosses the y-axis.

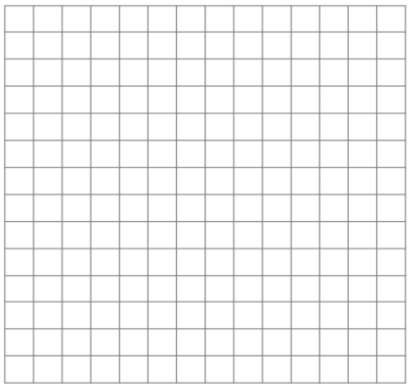
(ii) By substituting $y = 0$, find the coordinates of the point where the line crosses the x-axis.

(iii) Draw a graph of the line $3x + y = 6$.

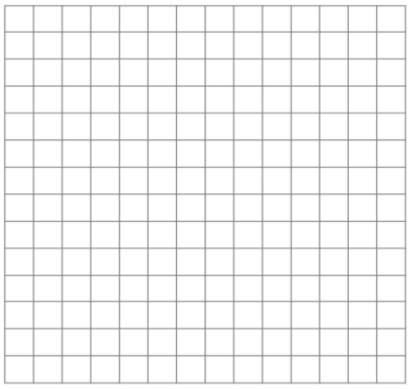


6. Find the coordinates of the points at which the line $x - 2y - 6 = 0$ intersects the x-axis and y-axis.

Now use these points to draw a sketch of the line.



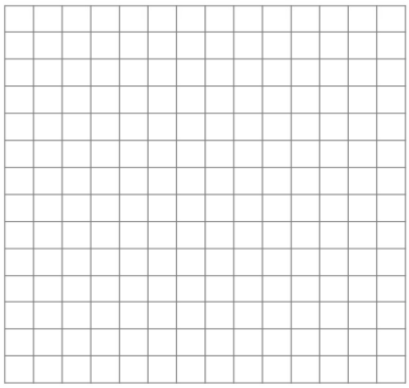
7. Find the coordinates of the points where the line $x - 2y = 5$ intersects the x-axis and y-axis. Hence draw a sketch of the line.



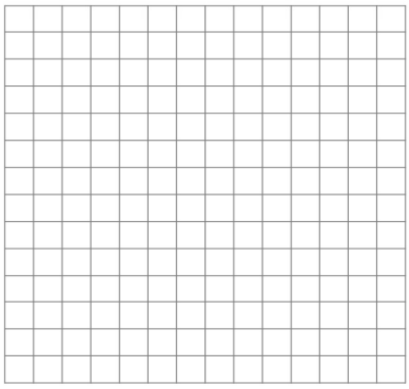
8. Draw these graphs on the same diagram.

(i) $x + y = 2$ (ii) $x + y = 3$ (iii) $x + y = 5$

What do they all have in common?



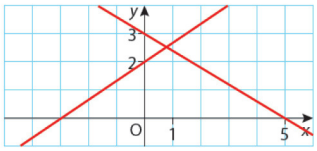
9. Draw a sketch of the line $2x - y + 6 = 0$.
Hence write down the area of the triangle formed by the x-axis, the y-axis and the line.



10. The equations of the lines a and b are:

a: $y = \frac{2}{3}x + 2$

b: $3x + 5y - 15 = 0$



(i) Which line intersects the y-axis at $(0, 2)$?

(ii) Which line intersects the x-axis at $(5, 0)$?

(iii) Use the slopes of the two lines to investigate whether the lines are perpendicular to each other.

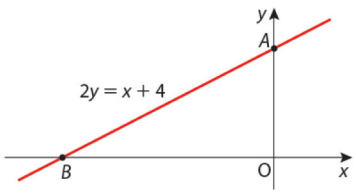
(iv) Write down the area of the triangle formed by the line $3x + 5y - 15 = 0$, the x-axis and the y-axis.

11. The diagram shows a sketch of the line $2y = x + 4$

(i) Find the coordinates of points A and B.

(ii) What is the gradient of the line?

Gradient is another word for slope.



12. Each of the following lines contains the origin (0, 0).

By taking a value for x and then finding the corresponding y-value, sketch each of the lines on separate diagrams:

(i) $x - 2y = 0$ (ii) $x + 3y = 0$ (iii) $3x - y = 0$ (iv) $x - 4y = 0$.

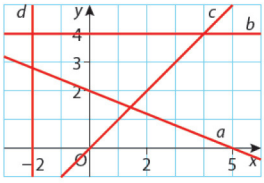
13. The lines a, b, c and d are graphed in the given diagram. Match each line with one of these equations:

(i) $x = -2$

(ii) $x - y = 0$

(iii) $2x + 5y = 10$

(iv) $y = 4$



14. (i) Verify that $(2, -5)$ is on the line $2x + y + 1 = 0$.

(ii) Verify that $(2, -3)$ is on the line $y = x - 5$.

(iii) Show that $(-3, 1)$ is not on the line $x - 3y + 1 = 0$.

(iv) Investigate if $(2, 0)$ is on the line $2x - y + 3 = 0$.

15. Show that $(-3, 1)$ is on the line $2x + 4y + 2 = 0$.

16. If $(1, 4)$ is on the line $2x + y + k = 0$, find the value of k.

17. If $(2, -3)$ is on the line $x + ky + 7 = 0$, find the value of k.

18. (i) Find the value of k if the line $2x + ky - 8 = 0$ contains the point $(3, 1)$.

(ii) If $(1, t)$ lies on the line $y = 2x + 3$, find the value of t.

Answers

Exercise 11.6

1. a: $y = 1$, b: $y = 3$, c: $x = 3$, d: $x = -1$

3. (i) 3 (ii) (0, 6) (iii) 4
(iv) 2 (v) 9 sq. units

4. (i) (0, 5) (ii) (5, 0)

5. (i) (0, 6) (ii) (2, 0)

6. (6, 0), (0, −3)

7. (5, 0), $(0, -2\frac{1}{2})$

8. Same slope, i.e. all parallel to each other

9. 9 sq. units

Answers

10. (i) a (ii) b
(iii) Not perpendicular (iv) $\frac{15}{2}$ sq. units

11. (i) A(0, 2), B(−4, 0) (ii) $\frac{1}{2}$

13. (i) d (ii) c (iii) a (iv) b

14. (iv) Not on this line

16. −6

17. 3

18. (i) 2 (ii) 5