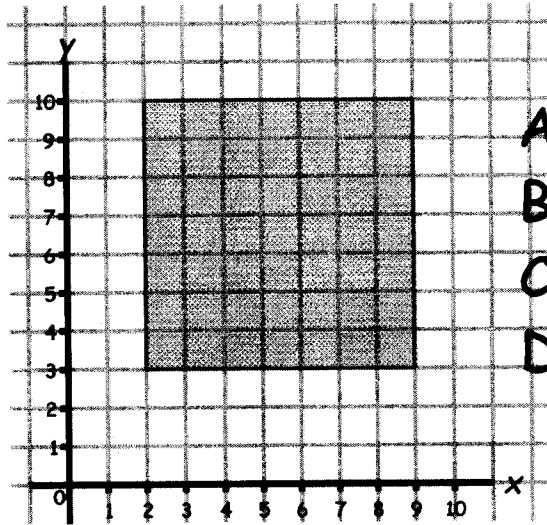


COORDINATES and STRAIGHT LINE GRAPHS

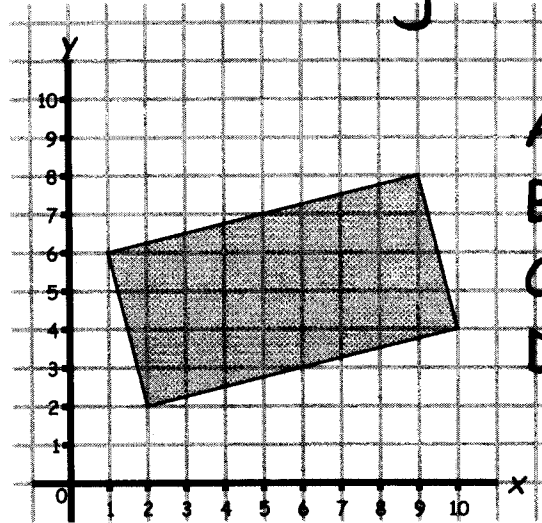
Page	Description
1	Coordinates in the first quadrant
2	Coordinates in all four quadrants
3	Introduction to straight line graphs and their rules
4	Gradients
5	Plot vertical, horizontal and diagonal lines
6	Plot vertical, horizontal and diagonal lines to form shapes
7	Find rules given straight lines
8	Find rules given straight lines
9	Reading the gradient and y intercept from a rule
10	Gradient of perpendicular lines
11	Recap

Square



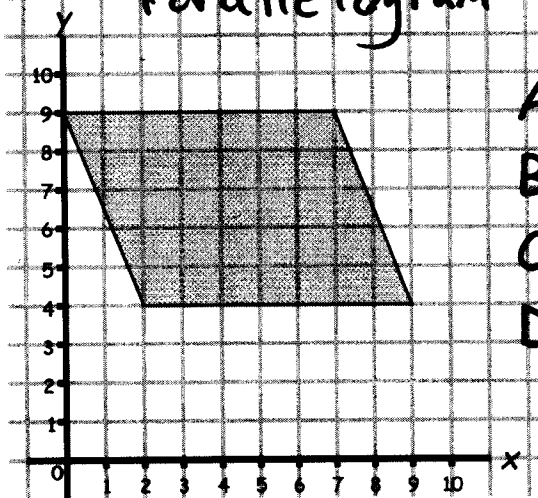
- A (2,10)
- B (9,10)
- C (9,3)
- D (2,3)

Rectangle



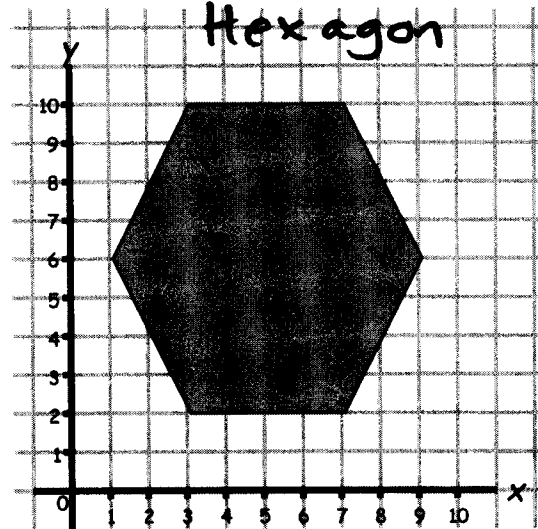
- A (1,6)
- B (9,8)
- C (10,4)
- D (2,2)

Parallelogram



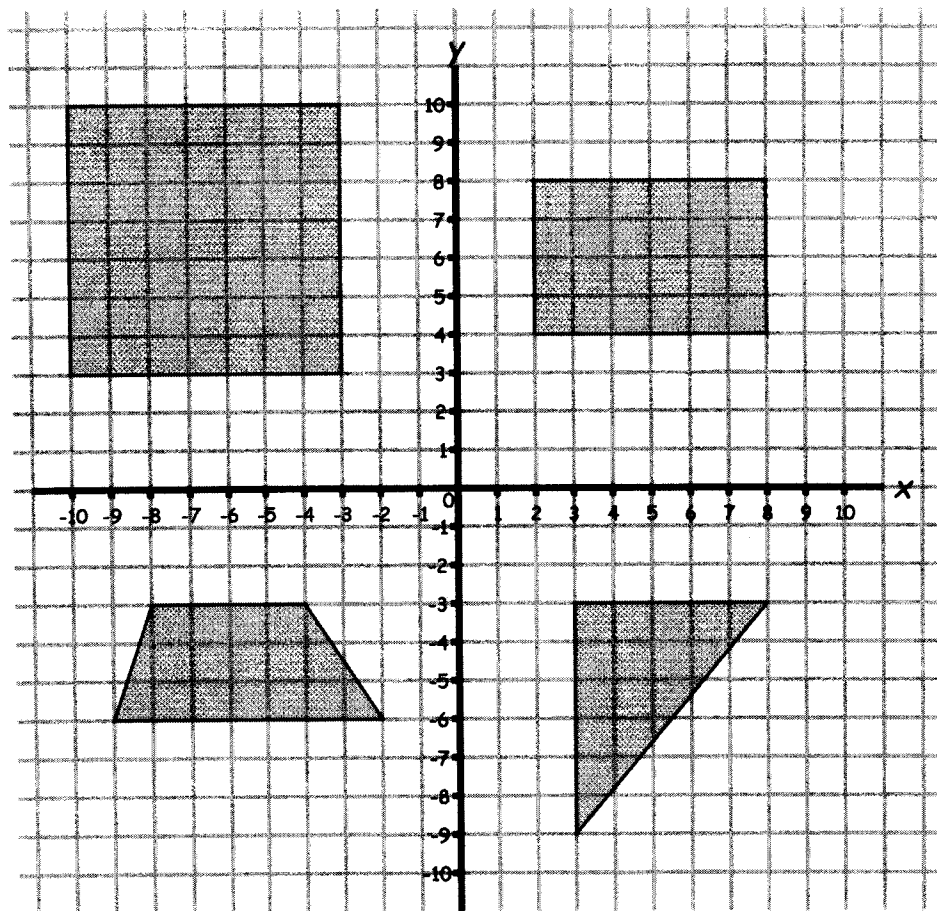
- A (0,9)
- B (7,9)
- C (9,4)
- D (2,4)

Hexagon



- A (1,6)
- B (3,10)
- C (7,10)
- D (9,6)
- E (7,2)
- F (3,2)

Plot the points, join them up in order to make a shape. Write the name of the shape.



A (-10,3)

B (-10,10)

C (-3,10)

D(-3,3)

Square

I (-9,-6)

J (-8,-3)

K (-4,-3)

L(-2,-6)

Trapezium

E (2,4)

F (2,8)

G (8,8)

H(8,4)

Rectangle

M (3,-9)

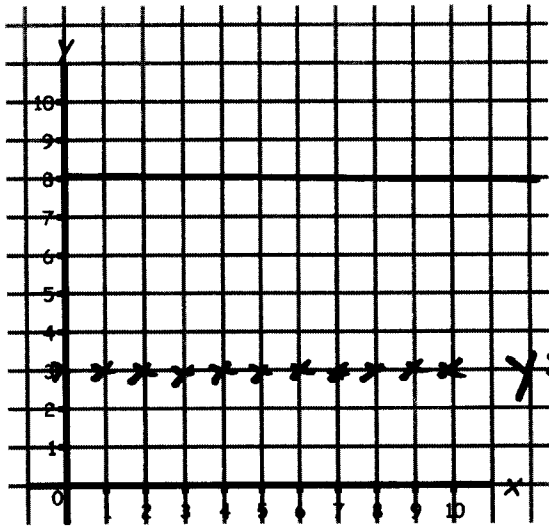
N (3,-3)

O (8,-3)

Triangle .

(2)

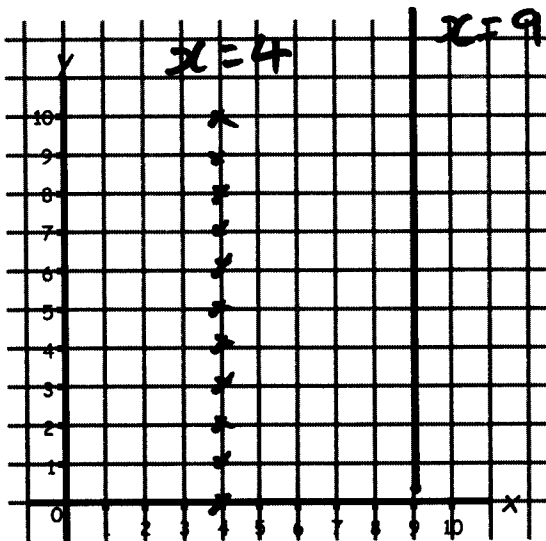
1) Plot these points on the grid



- (0,3)
- (1,3)
- (2,3)
- (3,3)
- (4,3)
- (5,3)
- (6,3)
- (7,3)
- (8,3)
- (9,3)
- (10,3)

2) On the grid draw the line $y = 8$

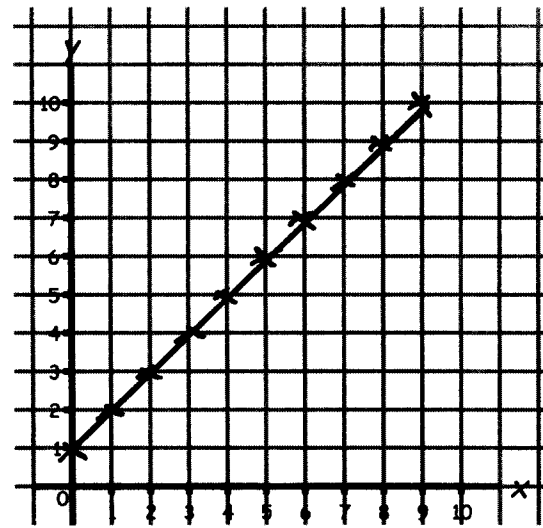
3) Plot these points on the grid



- (4,0)
- (4,1)
- (4,2)
- (4,3)
- (4,4)
- (4,5)
- (4,6)
- (4,7)
- (4,8)
- (4,9)
- (4,10)

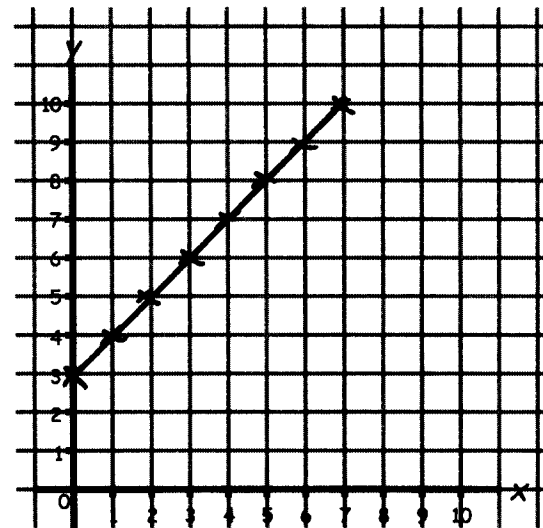
4) On the grid draw the line $x = 9$

5) Draw the line $y = x + 1$



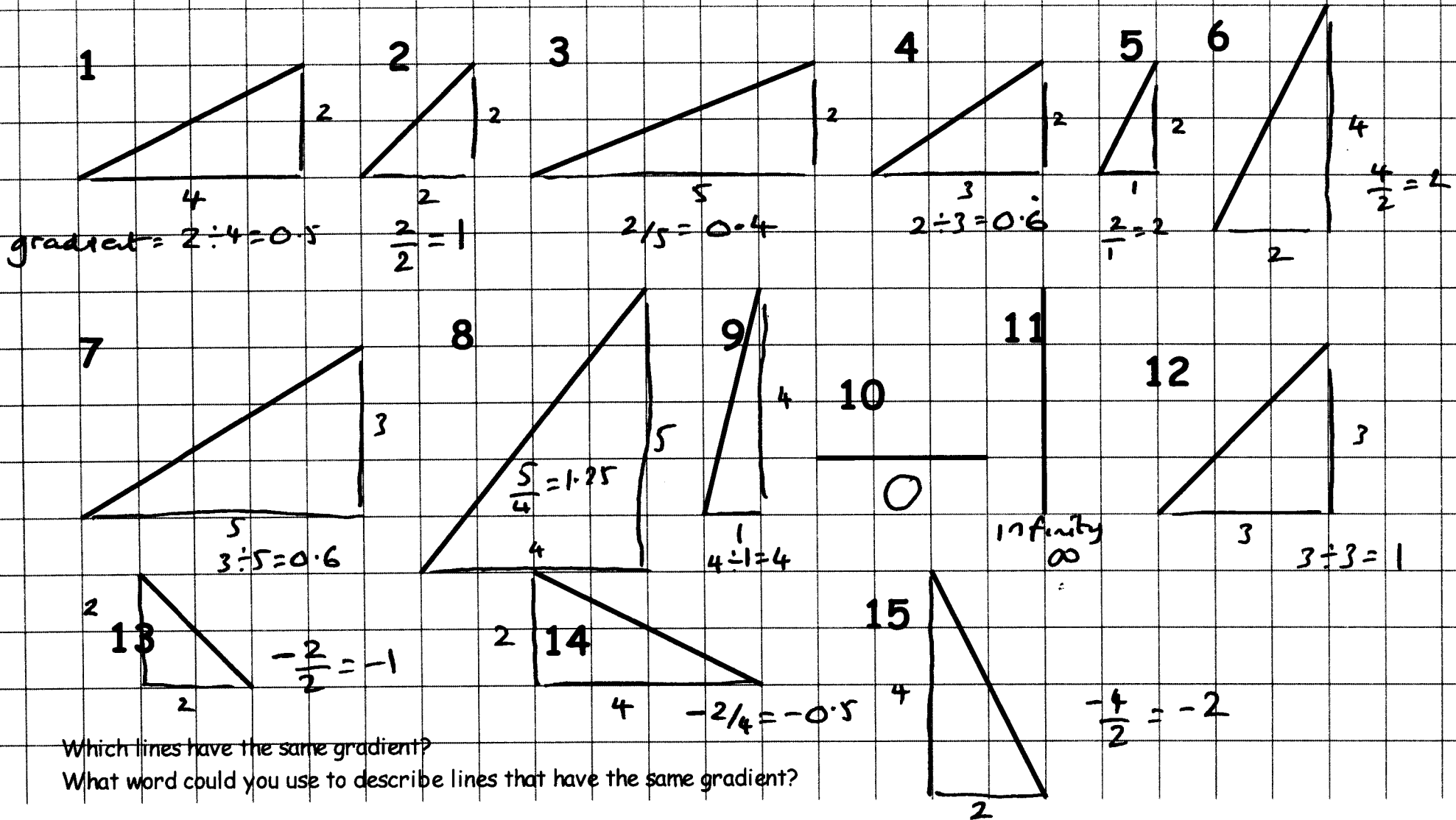
x	$y = x + 1$	plot (x,y)
0	$y = 0 + 1 = 1$	(0,1)
1	$y = 1 + 1 = 2$	(1,2)
2	$y = 2 + 1 = 3$	(2,3)
3	$y = 3 + 1 = 4$	3,4
4	$y = 4 + 1 = 5$	4,5
5	$y = 5 + 1 = 6$	5,6
6	$y = 6 + 1 = 7$	6,7
7	$y = 7 + 1 = 8$	7,8
8	$y = 8 + 1 = 9$	8,9
9	$y = 9 + 1 = 10$	9,10

6) Draw the line $y = x + 3$



x	$y = x + 3$	plot (x,y)
0	$y = 0 + 3 = 3$	(0,3)
1	$y = 1 + 3 = 4$	(1,4)
2	$y = 2 + 3 = 5$	(2,5)
3	$y = 3 + 3 = 6$	3,6
4	$y = 4 + 3 = 7$	4,7
5	$y = 5 + 3 = 8$	5,8
6	$y = 6 + 3 = 9$	6,9
7	$y = 7 + 3 = 10$	7,10

Calculate the gradient of these lines



Which lines have the same gradient?

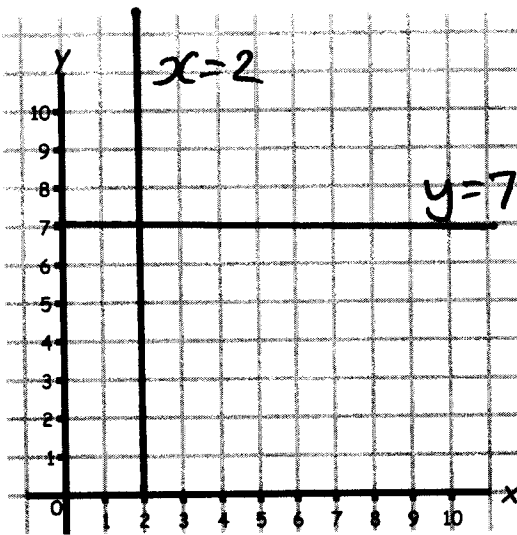
What word could you use to describe lines that have the same gradient?

Same gradient 2 and 12
5 and 6

PARALLEL

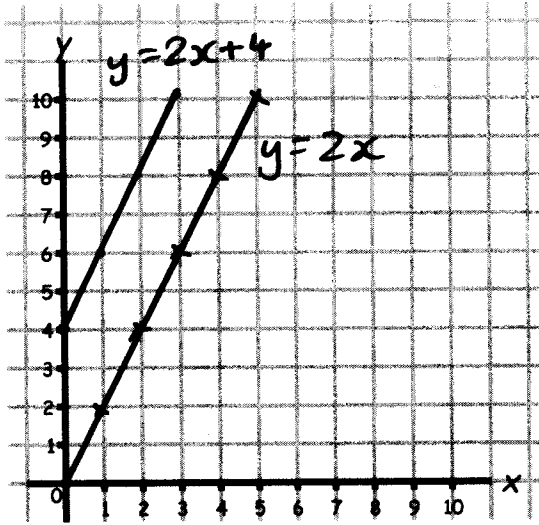
(4)

Horizontal and Vertical Lines



Plot Plot
 0,7 2,0
 1,7 2,1
 2,7 2,2
 3,7 2,3
 4,7 2,4
 5,7 2,5
 6,7 2,6
 10,7 2,7
 ↑ 2,10
 y is always 7
 x is always 2
 x=2

Diagonal line, positive gradient



Draw

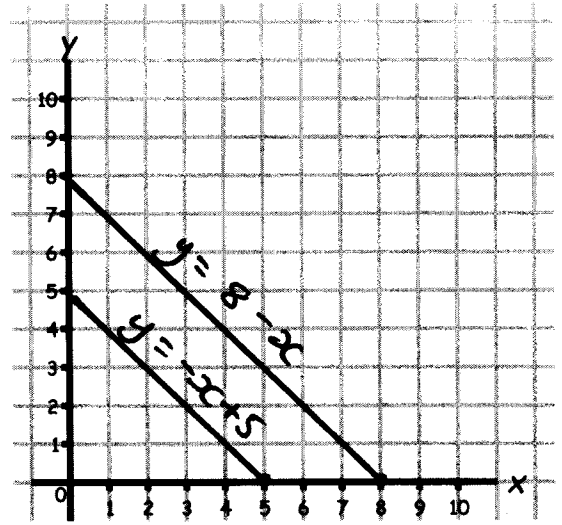
x	0	1	2	3	4	5
y	0	2	4	6	8	10

 y=2x
 Draw

x	0	1	2	3
y	4	6	8	10

 y=2x+4

Diagonal line, negative gradient



Draw

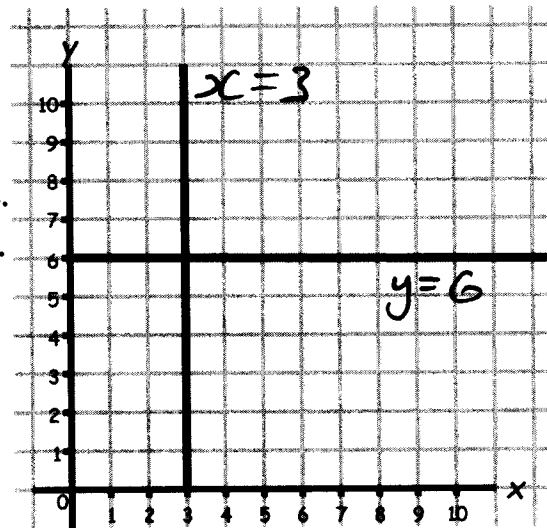
x	0	1	2	3	4	5	6	7	8
y	8	7	6	5	4	3	2	1	0

 y=8-x
 Draw

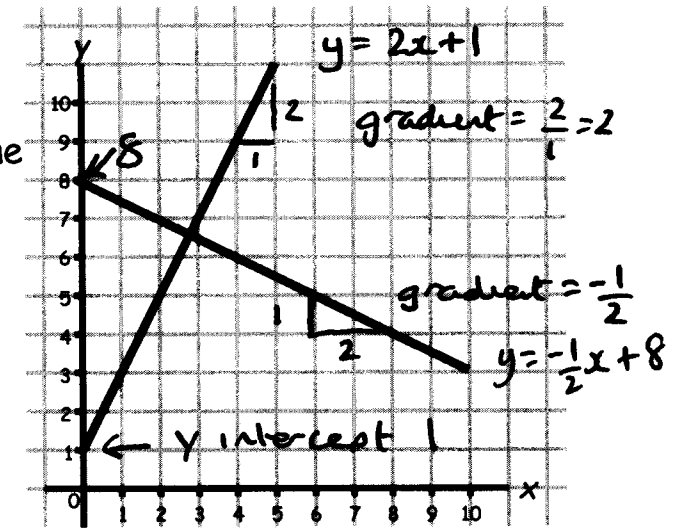
x	0	1	2	3	4	5
y	5	4	3	2	1	0

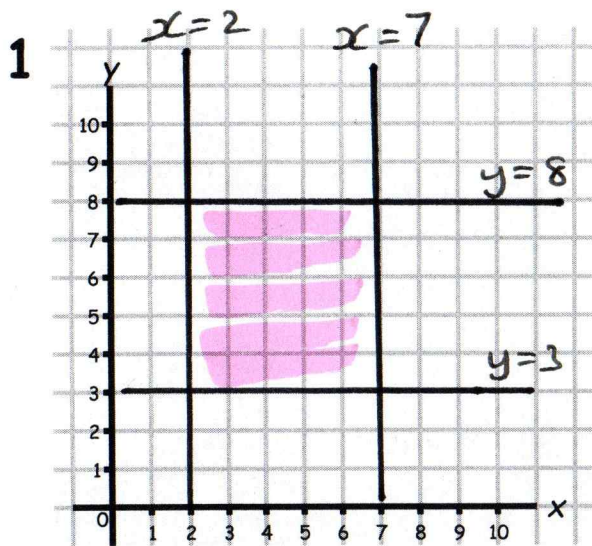
 y=-x+5

Find the equation of the line.
 Vertical and horizontal lines.



Find the equation of the line.
 Diagonal lines.





Draw the lines

$x = 2$

$x = 7$

$y = 3$

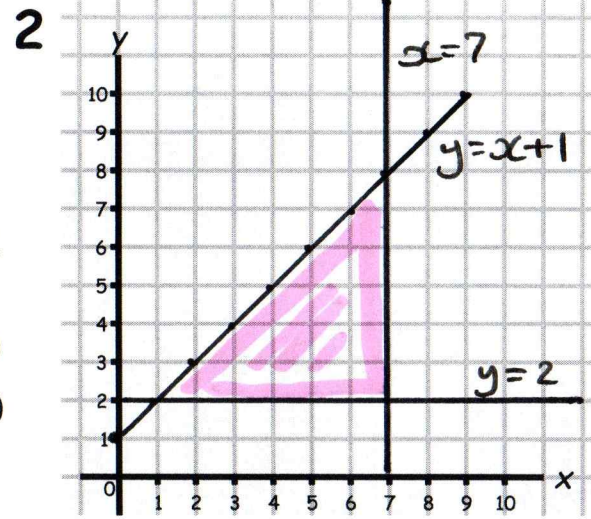
$y = 8$

Name of the shape *Square*

Coordinates of the corners

$(\underline{2}, \underline{3})$ $(\underline{2}, \underline{8})$

$(\underline{7}, \underline{8})$ $(\underline{7}, \underline{3})$



Draw the lines

$x = 7$

$y = 2$

$y = x + 1$

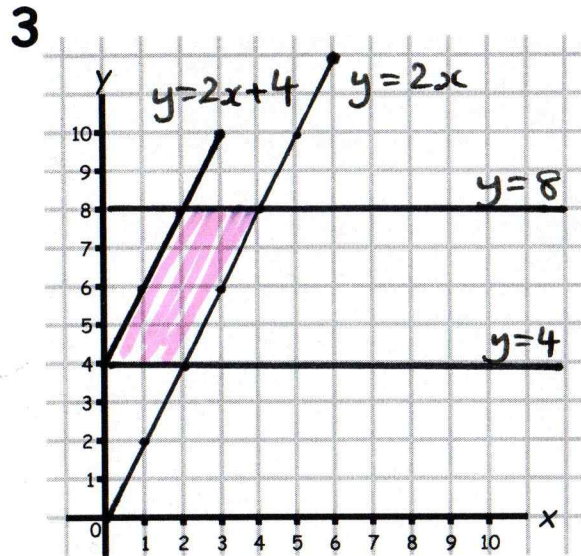
x	0	1	2	3	4	5	6	7	8	9
y	1	2	3	4	5	6	7	8	9	10

Name of the shape *triangle*

Coordinates of the corners

$(\underline{1}, \underline{2})$ $(\underline{7}, \underline{8})$

$(\underline{7}, \underline{2})$



Draw the lines

$y = 4$

$y = 8$

$y = 2x$

x	0	1	2	3	4	5
y	0	2	4	6	8	10

$y = 2x + 4$

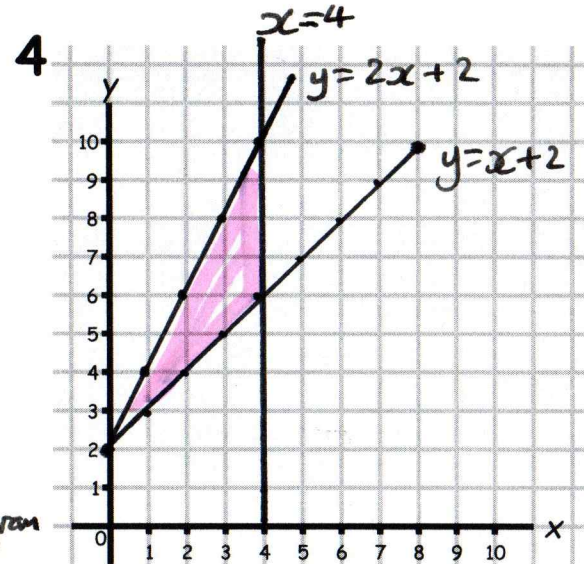
x	0	1	2	3
y	4	6	8	10

Name of the shape *Parallelogram*

Coordinates of the corners

$(\underline{0}, \underline{4})$ $(\underline{2}, \underline{8})$

$(\underline{4}, \underline{8})$ $(\underline{2}, \underline{4})$



Draw the lines

$x = 4$

$y = 2x + 2$

x	0	1	2	3	4
y	2	4	6	8	10

$y = x + 2$

x	0	1	2	3	4	5	6	7	8
y	2	3	4	5	6	7	8	9	10

Name of the shape

Coordinates of the corners

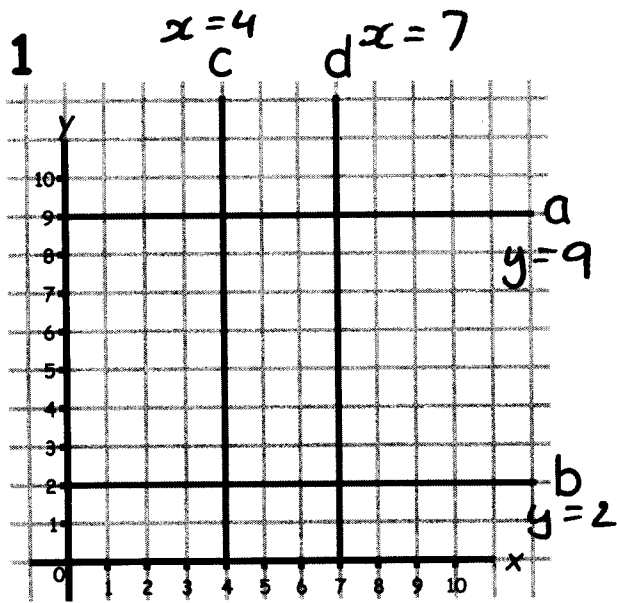
$(\underline{0}, \underline{2})$ $(\underline{4}, \underline{10})$

$(\underline{4}, \underline{6})$

triangle

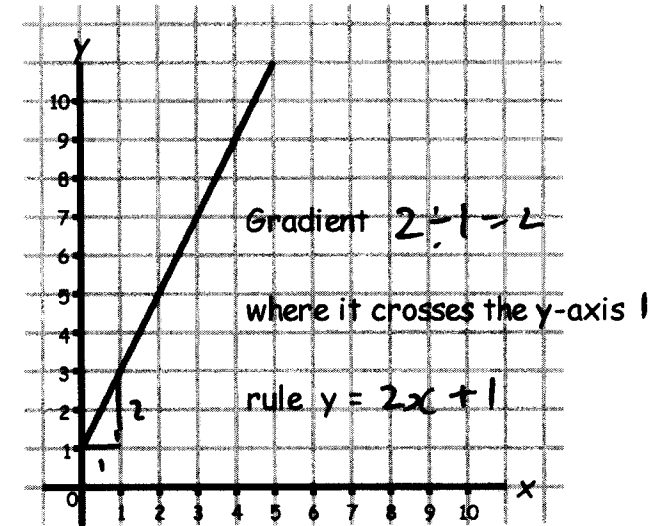
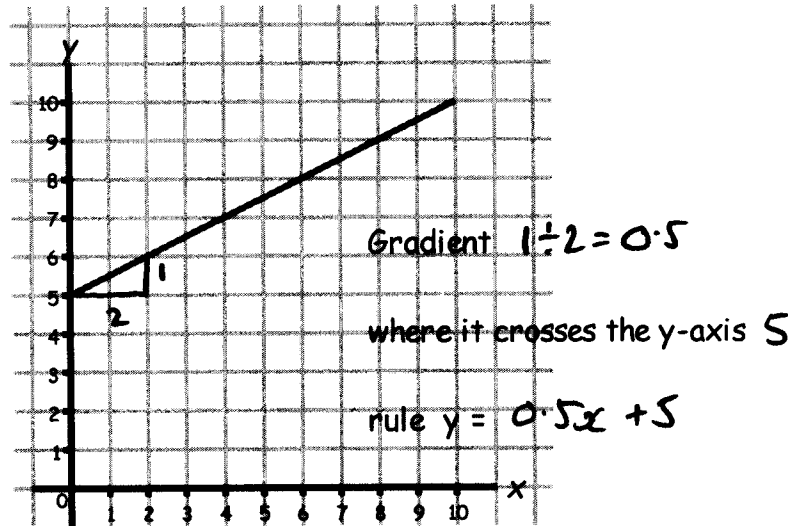
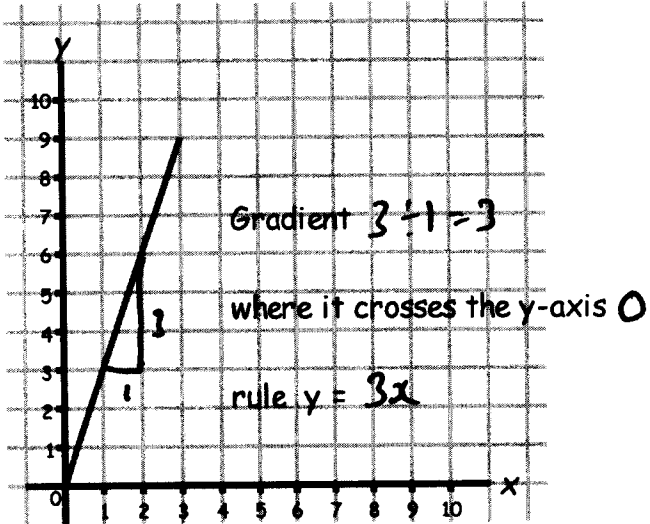
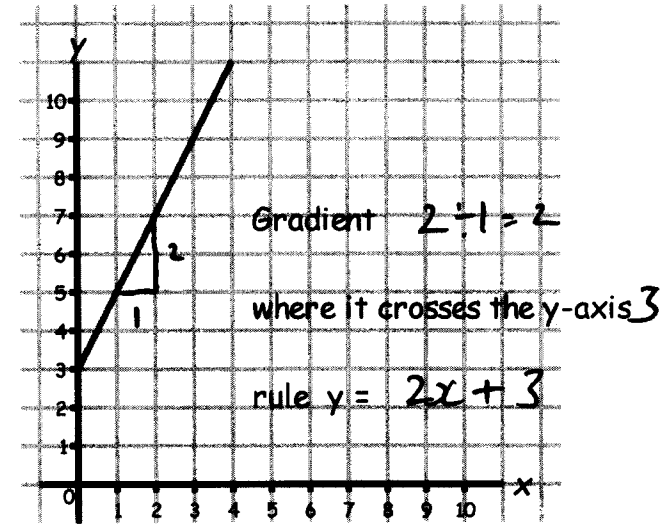
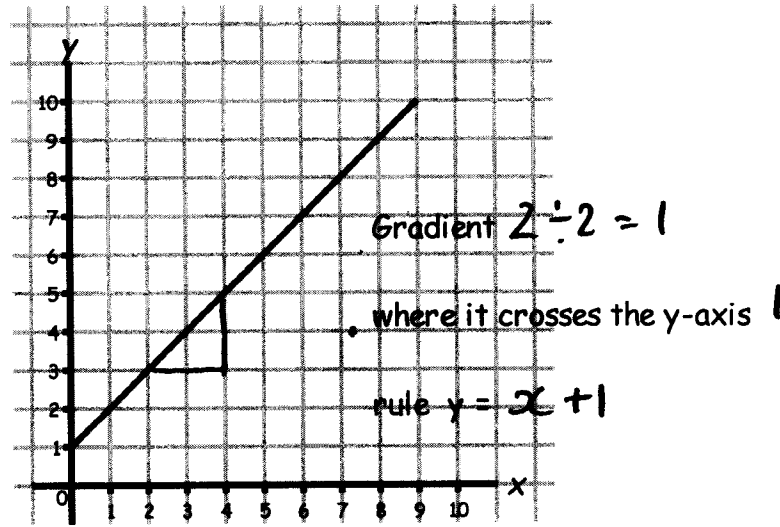
vertical lines $x = \text{a number}$

horizontal lines $y = \text{a number}$

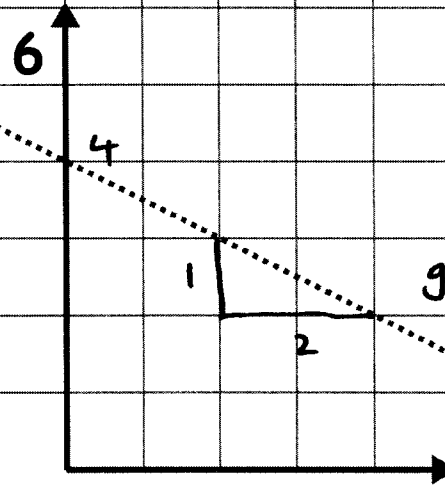
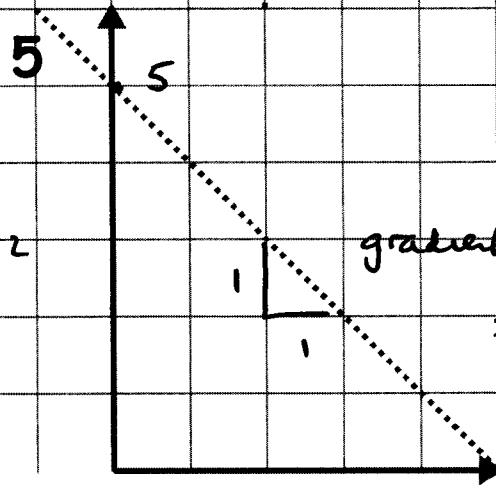
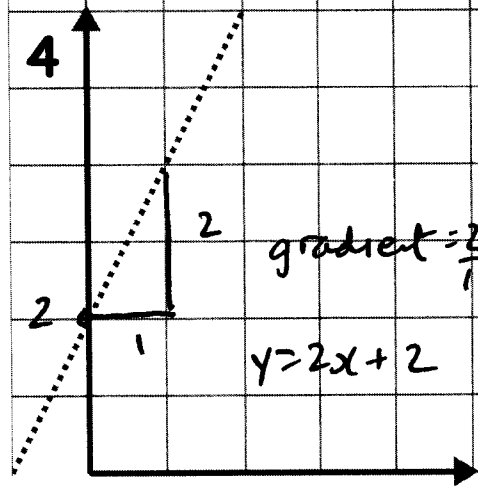
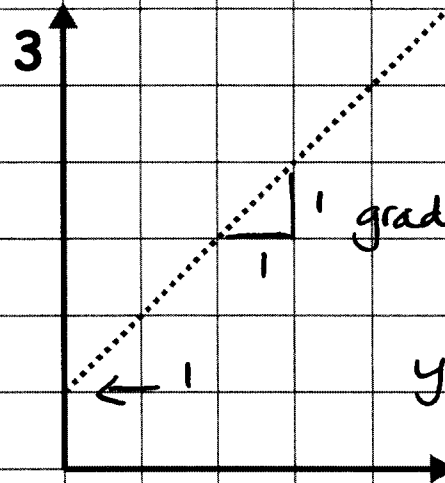
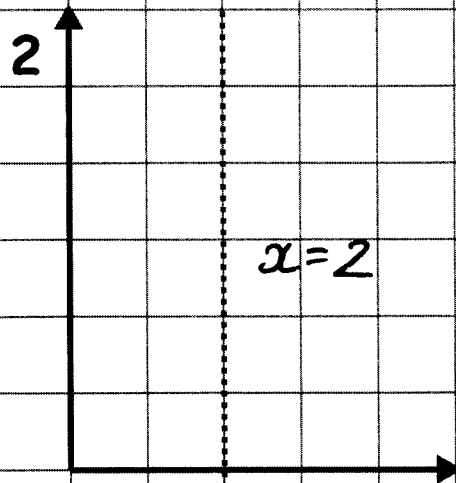
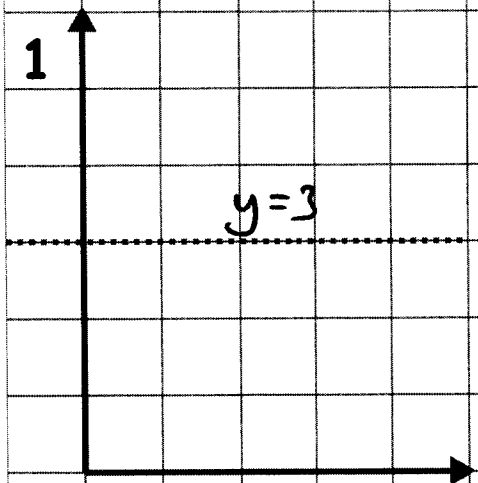


Diagonal lines

$y = \text{gradient times } x + \text{where it crosses the } y\text{-axis}$



Find the equation of the dotted line for each question

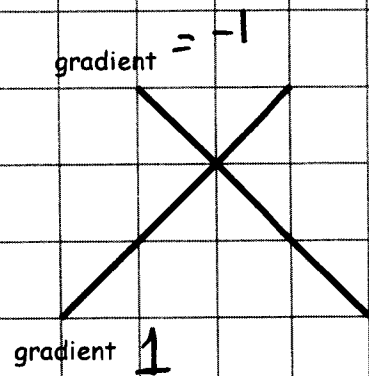


The general equation of a straight line

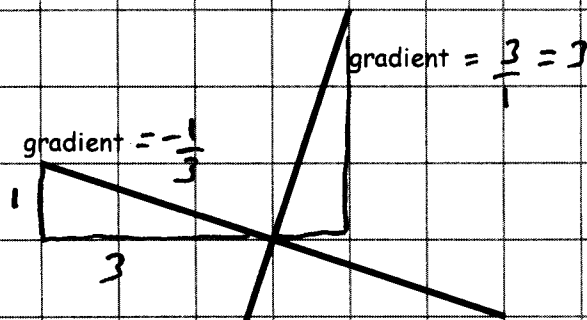
$y = \text{gradient times } x + \text{where graph crosses the } y \text{ axis}$
 (y - intercept)

	gradient	y intercept		gradient	y intercept
1) $y = 2x + 1$	2	1	6) $2y = 2x + 4$ $\div 2 \quad y = x + 2$	1	2
2) $y = 5x - 3$	5	-3	7) $y + x = 3$ $y = -x + 3$	-1	3
3) $y = 7x - 1$	7	-1	8) $2x - 2y = 5$ $2y = 2x - 5$ $y = x - 2.5$	1	-2.5
4) $y = 4 + 3x$	3	4	9) $3x + 4y = 8$ $4y = -3x + 8$ $y = -\frac{3}{4}x + 2$	$-\frac{3}{4}$	+2
5) $y = -2x - 6$	-2	-6	10) $8 = 2x - y$ $8 + y = 2x$ $y = 2x - 8$	2	-8

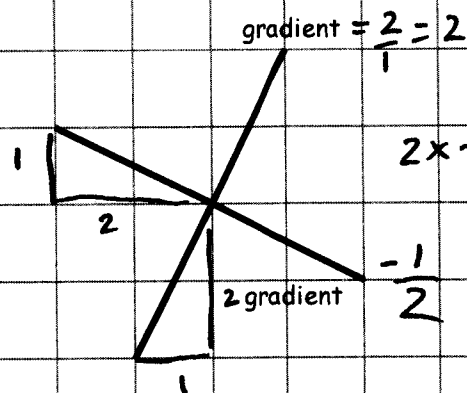
Gradients of perpendicular lines



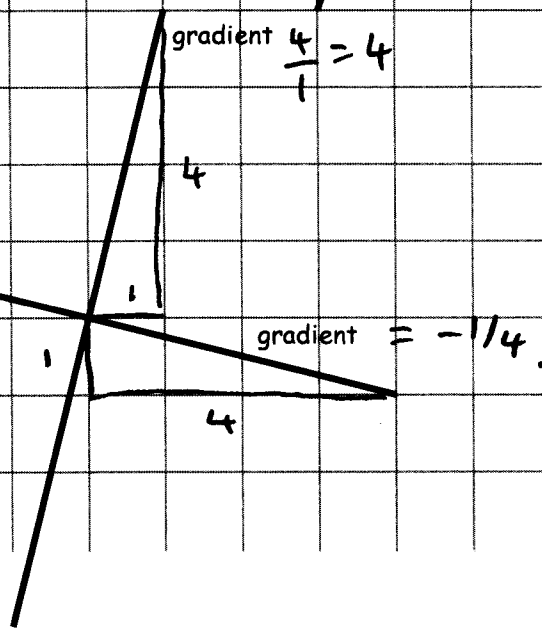
$$1 \times -1 = -1$$



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



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



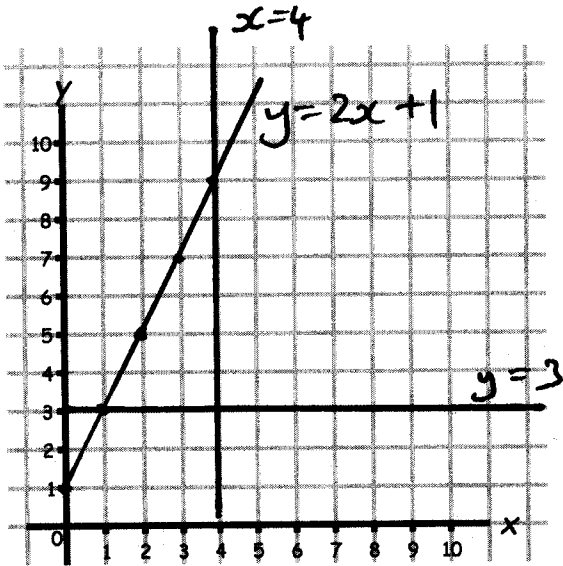
$$4 \times -\frac{1}{4} = -1$$

If two lines are perpendicular then when you multiply the gradients it equals -1

The gradient of a perpendicular line is the negative reciprocal.

perpendicular to 5 is $-\frac{1}{5}$ (10)

1



Draw the lines

$y = 3$

$x = 4$

$y = 2x + 1$

x	0	1	2	3	4
y	1	3	5	7	9

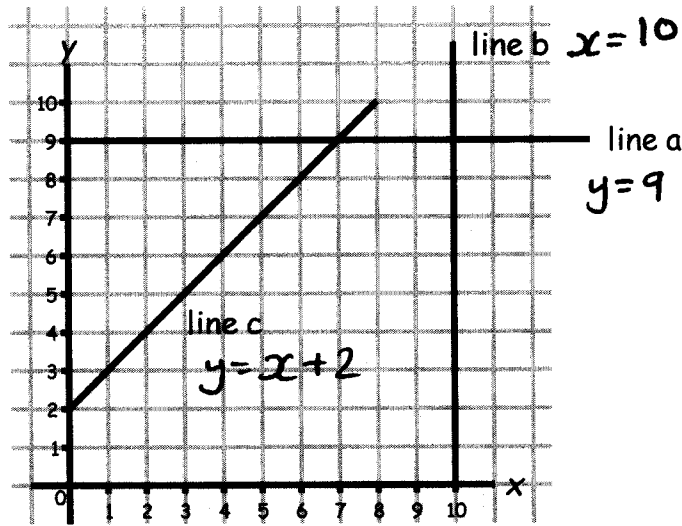
2

What is the gradient of the lines

a) $y = 3$ b) $x = 4$ c) $y = 2x + 1$

0 ∞ 2

3

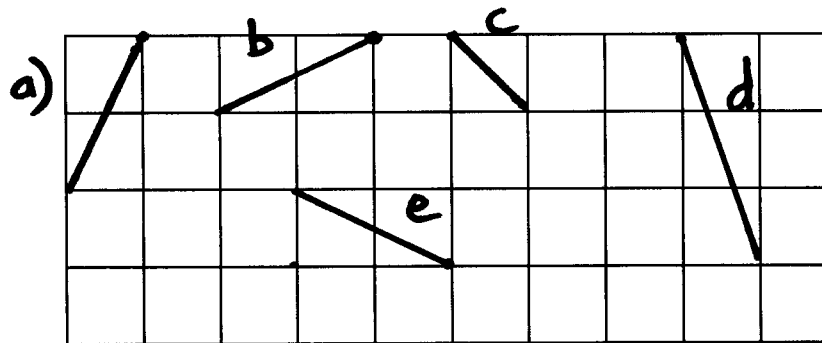


Write down the rules for lines a, b and c.

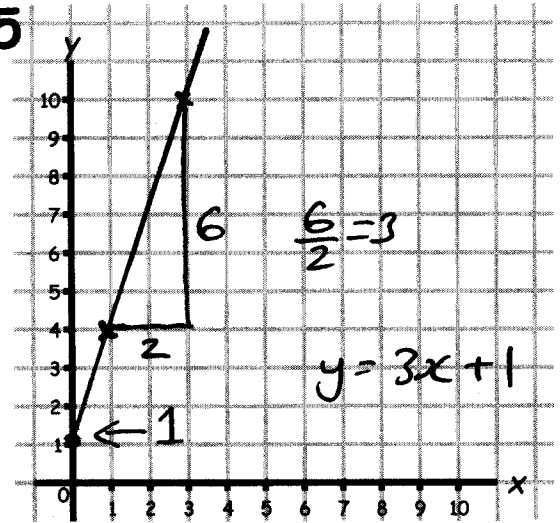
4

On the grid, draw and label lines with these gradients.

a) 2 b) $\frac{1}{2}$ c) -1 d) -3 e) $-\frac{1}{2}$



5



Plot the points (1,4) and (3,10). Join them a straight line. Find the rule for this line.

6

- A $y = 2x + 1$
- B $y = 4x + 1$
- C $y = 2x - 3$
- D $y = -0.5x$

Choosing from the graphs A to D, which graphs will

- a) be parallel A, C
- b) cross the y-axis at the same point A, B
- c) be perpendicular? A, D C, D