

## exercise 7.3

- 1 Each of the following equations represents a linear relationship. Copy and complete the table to show the gradient and the  $y$ -intercept of each relationship.

Equation	Gradient	$y$ -intercept
$y = 3x - 5$		
$y = -5x + 4$		
$y = x + 3$		
$y = -2x + 1$		
$y = x$		
$y = 3x + 2$		
$y = -4x - 1$		
$y = -x - 5$		
$y = 2x + 7$		
$y = 0.5x + 3.1$		

2 Write equations for the following lines.

a gradient 2 and y-intercept -6

c gradient  $\frac{2}{3}$  and y-intercept -1

e gradient  $\frac{5}{7}$  and y-intercept -3

b gradient -3 and y-intercept 4

d gradient  $-\frac{4}{5}$  and y-intercept 9

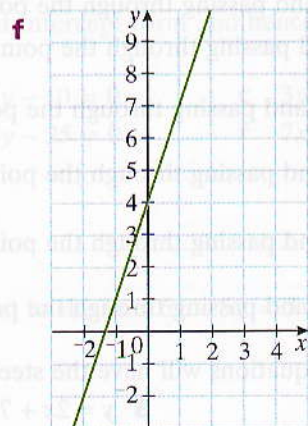
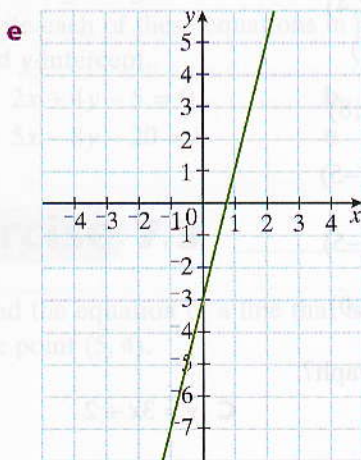
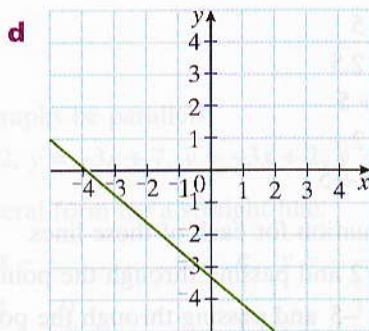
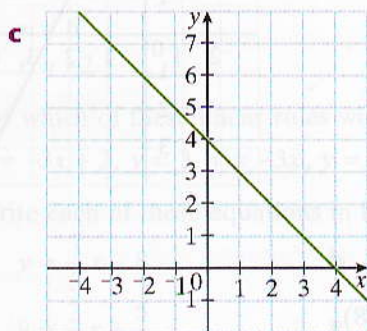
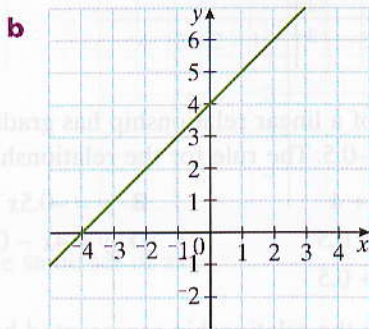
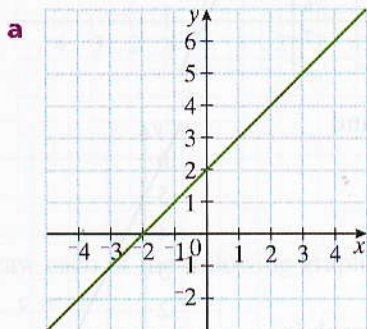
f gradient -3 and y-intercept  $\frac{1}{2}$

3 For each of these graphs

i find the gradient and hence write the value of  $m$

ii state the y-intercept, that is, the value of  $b$

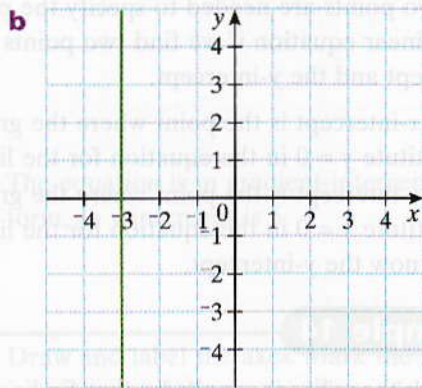
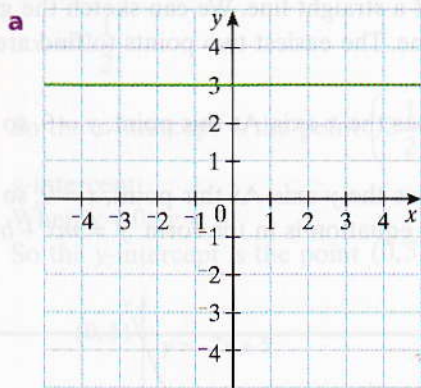
iii write the rule for the relationship in the form  $y = mx + b$







- 8** a Explain how we can tell from the rule of a linear relationship whether it passes through the origin.  
 b Explain how we can tell from the rule of a linear relationship whether it will slope upwards to the right or downwards to the right.
- 9** Write the rule for each of the graphs shown here.



- 10** Draw each of the following graphs on the same set of axes.

- a**  $y = -5$   
**b**  $x = 7$   
**c**  $y = 6$   
**d**  $x = -2$

- 11** For which of these linear rules will the graphs be parallel?

$y = -3x + 2$ ,  $y = 3$ ,  $y = -3x$ ,  $y = -2x + 2$ ,  $y = -3x + 7$ ,  $y = -3x + 2$ ,  $y = 3x$

- 12** Write each of these equations in the general form for a straight line.

- a**  $y = \frac{7}{3}x - 8$       **b**  $y = \frac{2}{5}x - 7$       **c**  $y = -\frac{2}{11}x - 1$   
**d**  $y = \frac{3}{2}x + \frac{5}{2}$       **e**  $y = -\frac{4}{5}x - \frac{9}{5}$       **f**  $y = -\frac{3}{4}x - \frac{5}{2}$

- 13** Write each of these equations in gradient-intercept form and hence state the gradient and y-intercept.

- a**  $2x + 4y - 5 = 0$       **b**  $5x - 2y - 10 = 0$       **c**  $3y - 4x - 15 = 0$   
**d**  $5x - 8y - 20 = 0$       **e**  $6x - 4y - 25 = 0$       **f**  $7x + 4y - 10 = 0$

## exercise 7.3

## challenge

- 14** Find the equation of a line that is parallel to the line  $6x - 5y = 3$  and passes through the point  $(5, 4)$ .

## exercise 7.3

1

Equation	Gradient	y-intercept
$y = 3x - 5$	3	-5
$y = -5x + 4$	-5	4
$y = x + 3$	1	3
$y = -2x + 1$	-2	1
$y = x$	1	0
$y = 3x + 2$	3	2
$y = -4x - 1$	-4	-1
$y = -x - 5$	-1	-5
$y = 2x + 7$	2	7
$y = 0.5x + 3.1$	0.5	3.1

2 a  $y = 2x - 6$

b  $y = -3x + 4$

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

d  $y = -\frac{4}{5}x + 9$

e  $y = \frac{5}{7}x - 3$

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

3 a i 1

ii (0, 2)

iii  $y = x + 2$

b i 1

ii (0, 4)

iii  $y = x + 4$

c i -1

ii (0, 4)

iii  $y = -x + 4$

d i  $-3\frac{1}{3}$

ii  $-\frac{6}{7}$

iii  $y = \frac{-6}{7} - 3\frac{1}{3}$

e i 4

ii (0, -3)

iii  $y = 4x - 3$

f i 3

ii (0, 4)

iii  $y = 3x + 4$

g i 2

ii (0, 3)

iii  $y = 2x + 3$

h i -2

ii (0, -1)

iii  $y = -2x - 1$

4 D

5 C

6 a  $y = 2x + 7$

b  $y = -5x + 38$

c  $y = -3x - 2$

d  $y = 4x - 13$

e  $y = -\frac{5}{4}x + 11\frac{3}{4}$

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

g  $y = \frac{3}{4}x - 2\frac{3}{4}$

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

7 D

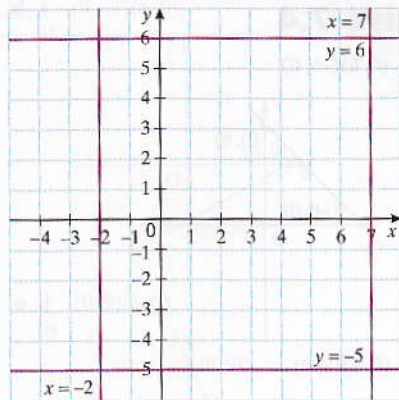
8 a If y-intercept is zero (i.e. the constant is zero).

b If gradient is positive it is upwards to the right, if negative then downward to the right.

9 a  $y = x$

b  $x = -3$

10



$$\left. \begin{array}{l} 11 \quad y = -3x + 2 \\ \quad y = -3x \\ \quad y = -3x + 7 \\ \quad y = -3x + 2 \end{array} \right\} \text{are parallel}$$

12 a  $7x - 3y - 24 = 0$

b  $2x - 5y - 35 = 0$

c  $2x + 11y + 11 = 0$

d  $3x - 2y + 5 = 0$

e  $4x + 5y + 9 = 0$

f  $3x + 4y + 10 = 0$

13 a  $y = -\frac{1}{2}x + 1\frac{1}{4}$

$m = -\frac{1}{2}, b = 1\frac{1}{4}$

b  $y = 2\frac{1}{2}x - 5$

$m = 2\frac{1}{2}, b = -5$

c  $y = 1\frac{1}{3}x + 5$

$m = 1\frac{1}{3}, b = 5$

d  $y = \frac{5}{8}x - 2\frac{1}{2}$

$m = \frac{5}{8}, b = -2\frac{1}{2}$

e  $y = 1\frac{1}{2}x - 6\frac{1}{4}$

$m = 1\frac{1}{2}, b = -6\frac{1}{4}$

f  $y = -1\frac{3}{4}x + 2\frac{1}{2}$

$m = -1\frac{3}{4}, b = 2\frac{1}{2}$