Gradient and intercept

1 Work out the gradients of lines A to F.

A = _____

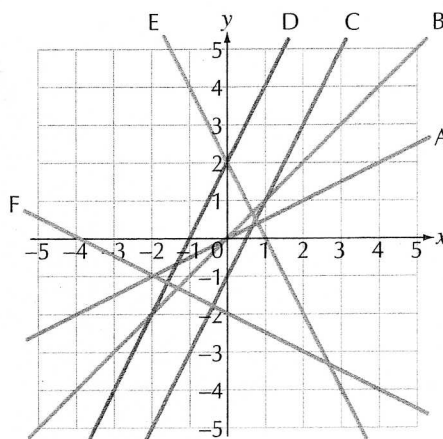B = _____

C = _____

D = _____

E = _____

F = _____

2 Write down the gradient of each of these lines.

a $y = 4x + 3$ **b** $y = 3 + x$ **c** $y = -\dfrac{1}{2}x + 5$ **d** $y = 6 - 2x$

gradient = _____ gradient = _____ gradient = _____ gradient = _____

3 **a** Which line in question 2 is the steepest? _____

b How do you know? _____

4 Write down the *y*-axis intercepts of each of these lines.

a $y = 3x + 4$ **b** $y = 3 + 2x$ **c** $y = -\dfrac{x}{3} + 2$ **d** $y = 3x$

intercept = _____ intercept = _____ intercept = _____ intercept = _____

5 Look at the straight line equations.

A: $y = x + 2$ B: $y = 2x + 1$ C: $y = 2x + 2$ D: $y = 3x - 1$ E: $y = x$

F: $y = -x$ G: $3 - x = y$ H: $y = 3 - 2x$ I: $y = 4 - 2x$

a Write the letter of the line with the steepest gradient. _____

b Which of the lines are parallel to each other? _____

c Write the letter of the line that crosses the *y*-axis at the highest point. _____

d Write the letter of the line that crosses the *y*-axis at the lowest point. _____

e How many of the lines have a negative gradient? _____
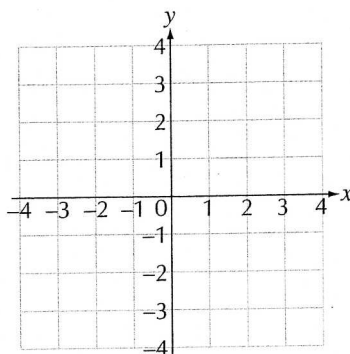
UNIT 2

Drawing graphs – linear

1 On the coordinate grid opposite draw and label these lines.

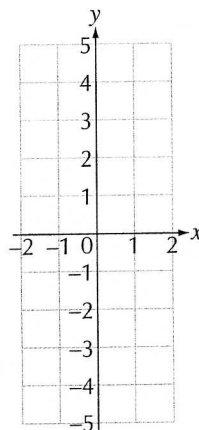**a** $x = 2$ **b** $y = -3$

c $x = -3$ **d** $y = 2$

2 **a** Complete this table of values for $y = 2x - 1$ for $-2 \le x \le 2$.

x	–2	–1	0	1	2
y	–5			1	

b Draw the graph of $y = 2x - 1$ on the grid opposite.

c Use the graph to find the value of x when $y = 0$.

$x =$ _____

3 **a** Draw the graph of $y = 3x + 2$ for $-3 \le x \le 3$.

b Use the graph to find the value of x when $y = -4$.

$x =$ _____

> **Remember:** The gradient-intercept method means you start by plotting the intercept and then plot other points by using the gradient.
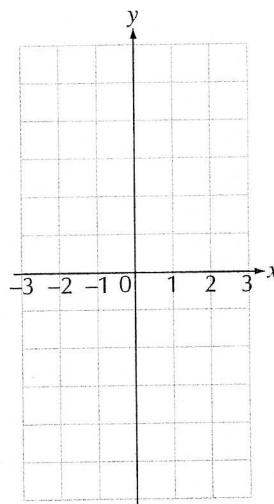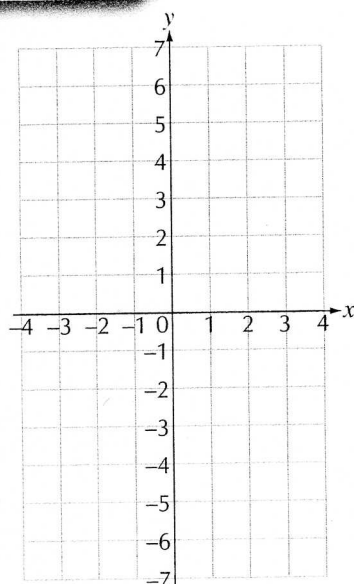
4 Use the gradient-intercept method to draw the following graphs on the grid opposite.

a $y = 2x + 2$

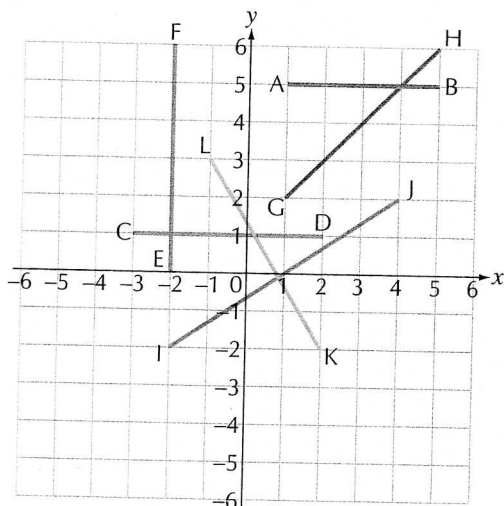**b** $y = -\dfrac{1}{2}x + 2$

c $y = x + 2$

d $y = 5 - 2x$

Midpoints

1 Work out the midpoint for each of the line segments shown on the grid.

Midpoint of: AB = (_____, _____),   CD = (_____, _____),   EF = (_____, _____),

GH = (_____, _____),   IJ = (_____, _____),   KL = (_____, _____)

2 Work out the midpoints of the line segment AB when

a A = (0, 2) and B = (4, 0) _____

b A = (−2, 0) and B = (0, 4) _____

c A = (−2, −1) and B = (2, 5) _____

d A = (−3, −1) and B = (6, 6) _____

3 ABCD is a quadrilateral with coordinates A(2, −1), B(6, 4), C(2, 6), D(−2, 1).

a Work out the coordinates of the midpoint of the diagonal AC. _____

b Work out the coordinates of the midpoint of the diagonal BD. _____

4 The coordinates of the midpoint of a line segment AB are (2, 4).

Work out the coordinates of B when A is at

a (0, 0) _____

b (1, 2) _____
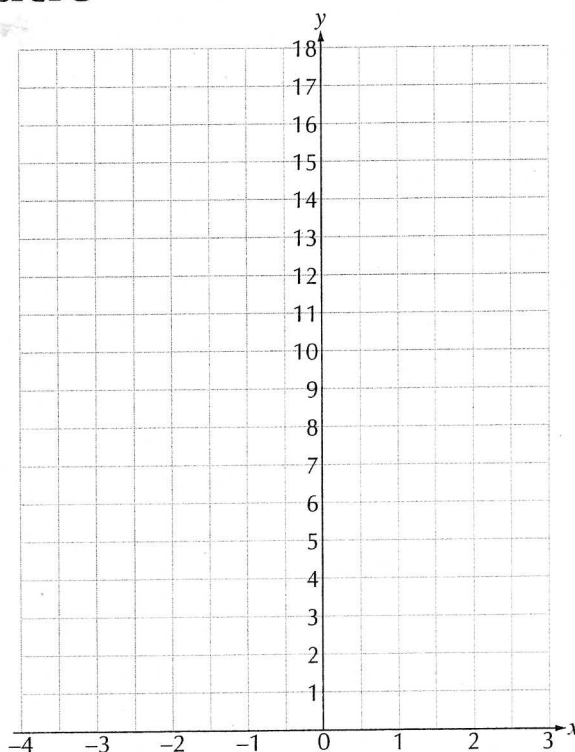
c (−1, 6) _____

Drawing graphs – quadratic

1 **a** Complete this table of values
for $y = x^2 + 2$ for $-4 \leq x \leq 3$.

x	-4	-3	-2	-1	0	1	2	3
y	18		3		6			

b Draw the graph of $y = x^2 + 2$ on the grid opposite.

c Use the graph to find the value of y when $x = 1.5$.

$y = $ _____

2 **a** Complete this table of values
for $y = 2x^2 - 4x - 1$.

x	-2	-1	0	1	2	3
y		5	-1		-1	

b Draw the graph of $y = 2x^2 - 4x - 1$ on the grid opposite.

c An approximate solution of the equation
$y = 2x^2 - 4x - 1$ is -0.22

i Explain how you can find this from your graph.

_____

ii Use your graph to write down another solution of this equation.

_____

UNIT 3

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