Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions

Drawing Quadratic Graphs 2

Calculator Allowed

INSTRUCTIONS TO CANDIDATES

Write your name in the space provided.

Write your answers in the spaces provided in this question paper.

Answer ALL questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You should have a ruler, compass and protractor where required.

Total Marks :

1) *(a)* The table below shows some of the values of $y = 2x^2 - 5x - 1$ for values of x from –2 to 4.

Complete the table by finding the value of y for $x = -1$ and for $x = 2$. [2]

x	−2	−1	0	1	2	3	4
$y = 2x^2 - 5x - 1$	17		−1	−4		2	11

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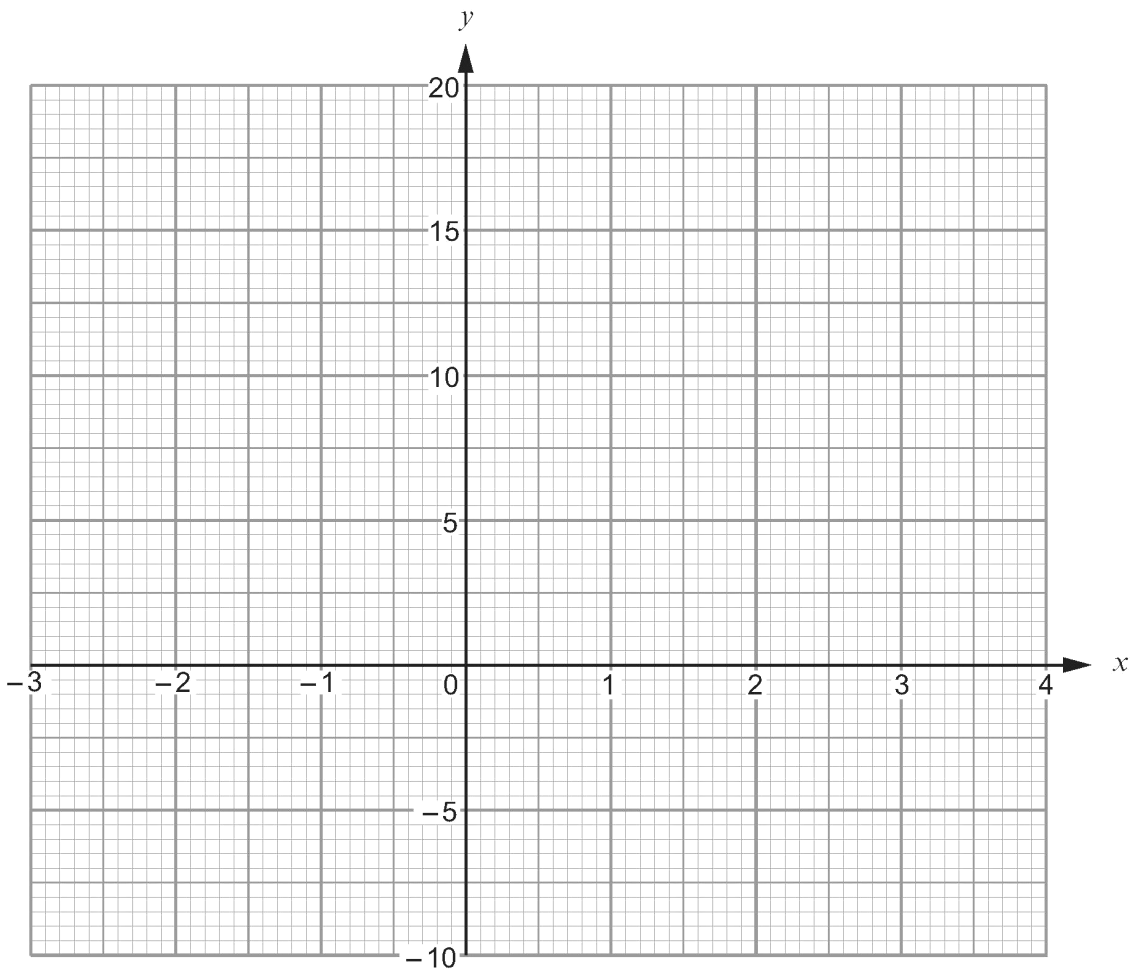
(b) On the graph paper below, draw the graph of $y = 2x^2 - 5x - 1$ for values of x from –2 to 4. [2]



(c) Draw the line $y = 5$ on the graph paper.

Write down the values of x where the line $y = 5$ cuts the curve $y = 2x^2 - 5x - 1$.
Give your answers correct to 1 decimal place. [2]

Values of x are ..... and .....

(d) Circle the equation below whose solutions are the values you have given in *(c)*. [1]

$2x^2 - 5x - 1 = 0$ $2x^2 - 5x - 6 = 0$ $2x^2 - 5x - 5 = 0$

$2x^2 - x - 1 = 0$ $2x^2 - 5x + 4 = 0$

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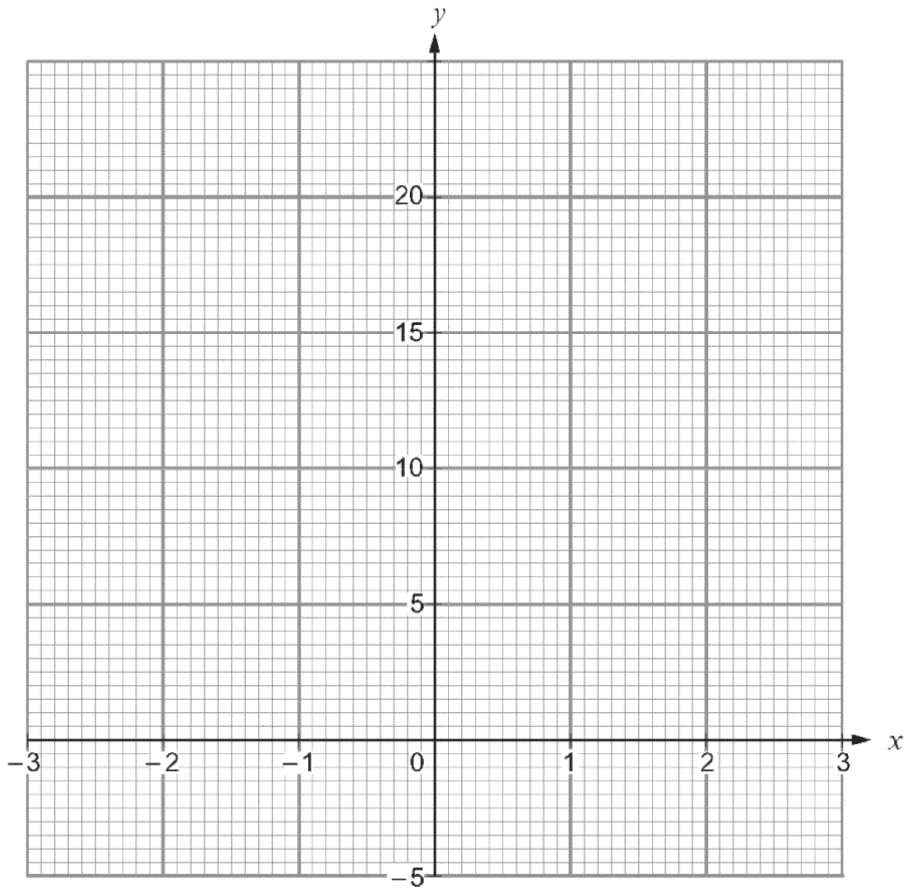
2) *(a)* On the graph paper below, draw the graph of $y = 2x^2 - x - 3$ for values of x from -3 to 3. [4]



(b) Use your graph to write down the solutions of the equation $2x^2 - x - 3 = 0$. [1]

(c) By drawing an appropriate straight line on the same set of axes, use your graph to solve the equation $2x^2 - 7 = 0$. [3]

3) The table shows some of the values of $y = 3x^2 + x + 2$ for values of x from –2 to 3.

(a) Complete the table by finding the value of y for $x = -1$ and $x = 2$. [2]

x	–2	–1	0	1	2	3
$y = 3x^2 + x + 2$	12		2	6		32

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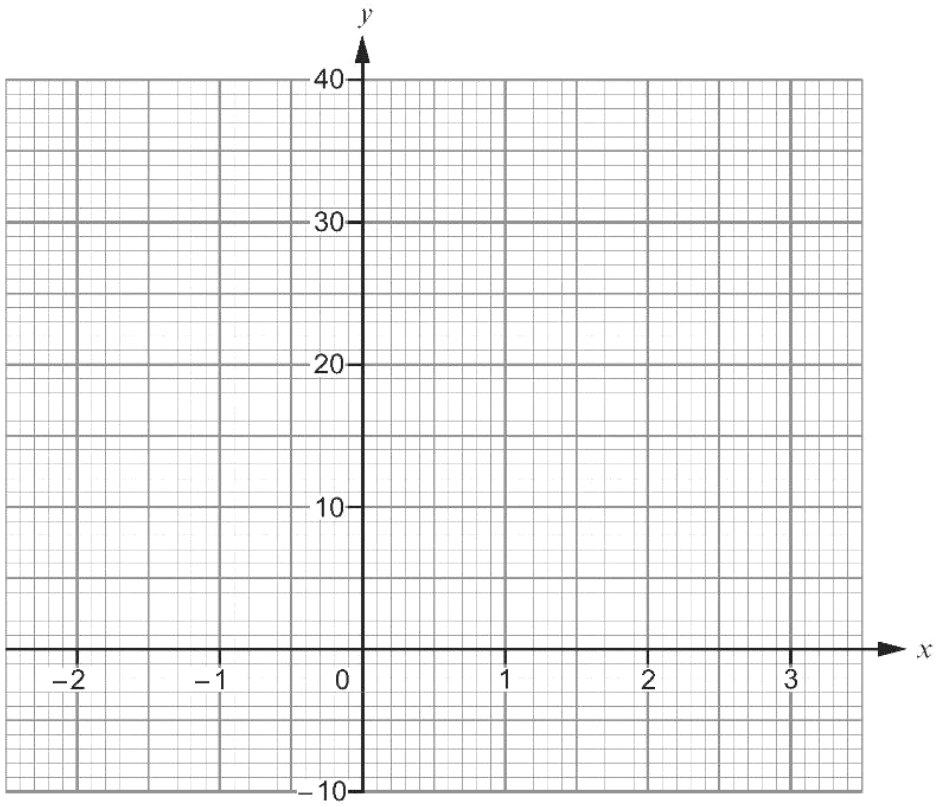
(b) On the graph paper below, draw the graph of $y = 3x^2 + x + 2$ for values of x from –2 to 3. [2]



(c) Use your graph to solve the equation $3x^2 + x + 2 = 7$. [2]

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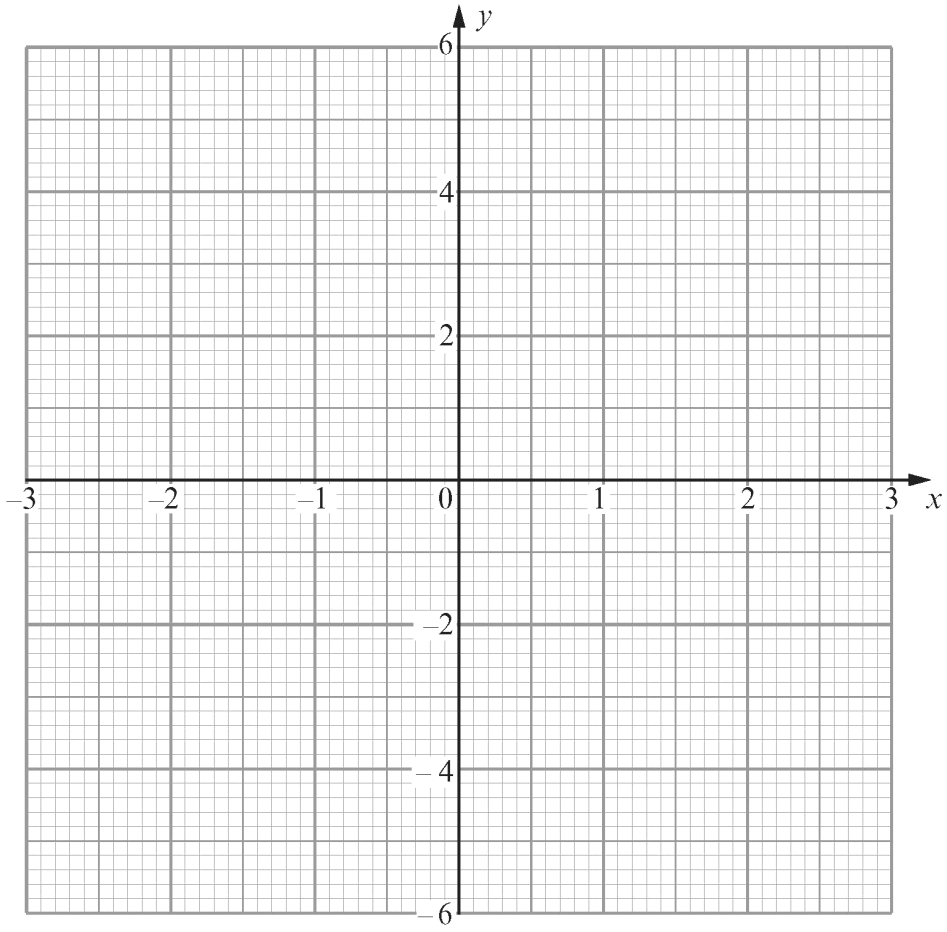
4) The table shows the values of $y = x^2 - 3$ for values of x from –3 to 3.

x	–3	–2	–1	0	1	2	3
$y = x^2 - 3$	6	1	–2	–3	–2	1	6

(a) On the graph paper below, draw the graph of $y = x^2 - 3$ for values of x between –3 and 3. [2]



(b) Write down the x-values of the points where the graph cuts the x-axis.

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[1]

5) The following table shows values of $y = x^2 - 2x - 3$ for values of x from –2 to 5.

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

(a) Complete the table by finding the values of y when $x = -1$ and $x = 5$. [2]

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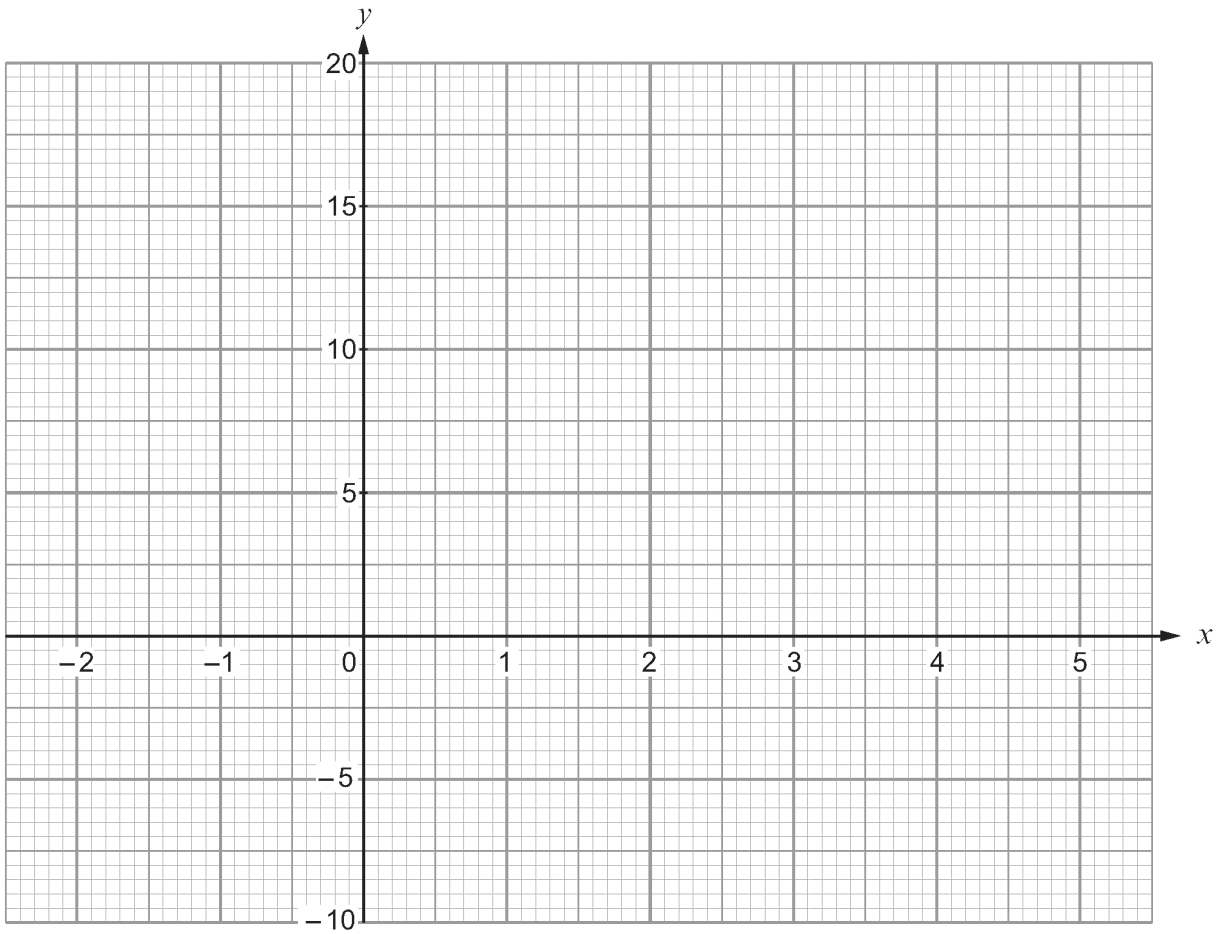
(b) Use the graph paper below to sketch the graph of $y = x^2 - 2x - 3$. [2]



(c) Draw the line $y = 3$ on the same graph paper. [1]

(d) Write down the x-coordinates of the points where the curve $y = x^2 - 2x - 3$ intersects the line $y = 3$. [1]

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6) The table shows values of $y = 3x^2 + 2x - 10$ for values of x from -4 to 3.

x	-4	-3	-2	-1	0	1	2	3
$y = 3x^2 + 2x - 10$	30		-2	-9	-10	-5	6	23

(a) Complete the table above.

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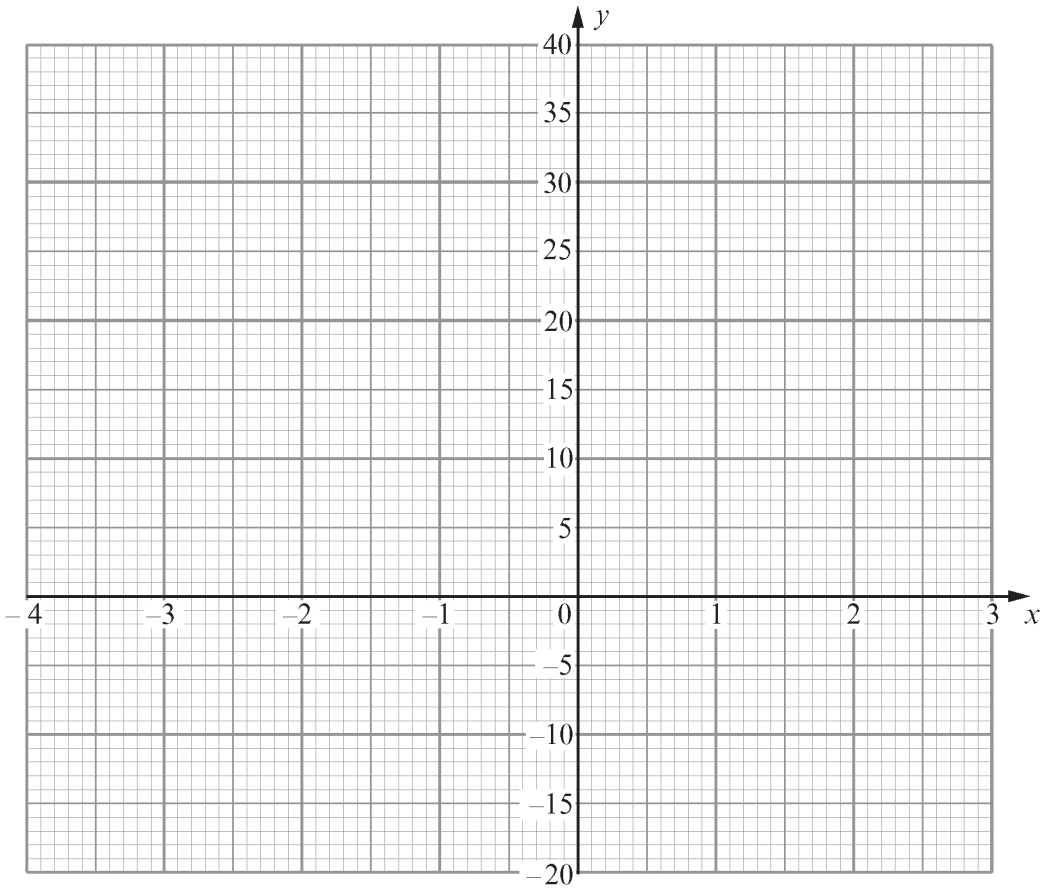
[1]

(b) On the graph paper, below draw the graph of $y = 3x^2 + 2x - 10$ for values of x from -4 to 3. [2]



(c) Write down the x-coordinates of the points where the graph of $y = 3x^2 + 2x - 10$ intersects the x-axis.

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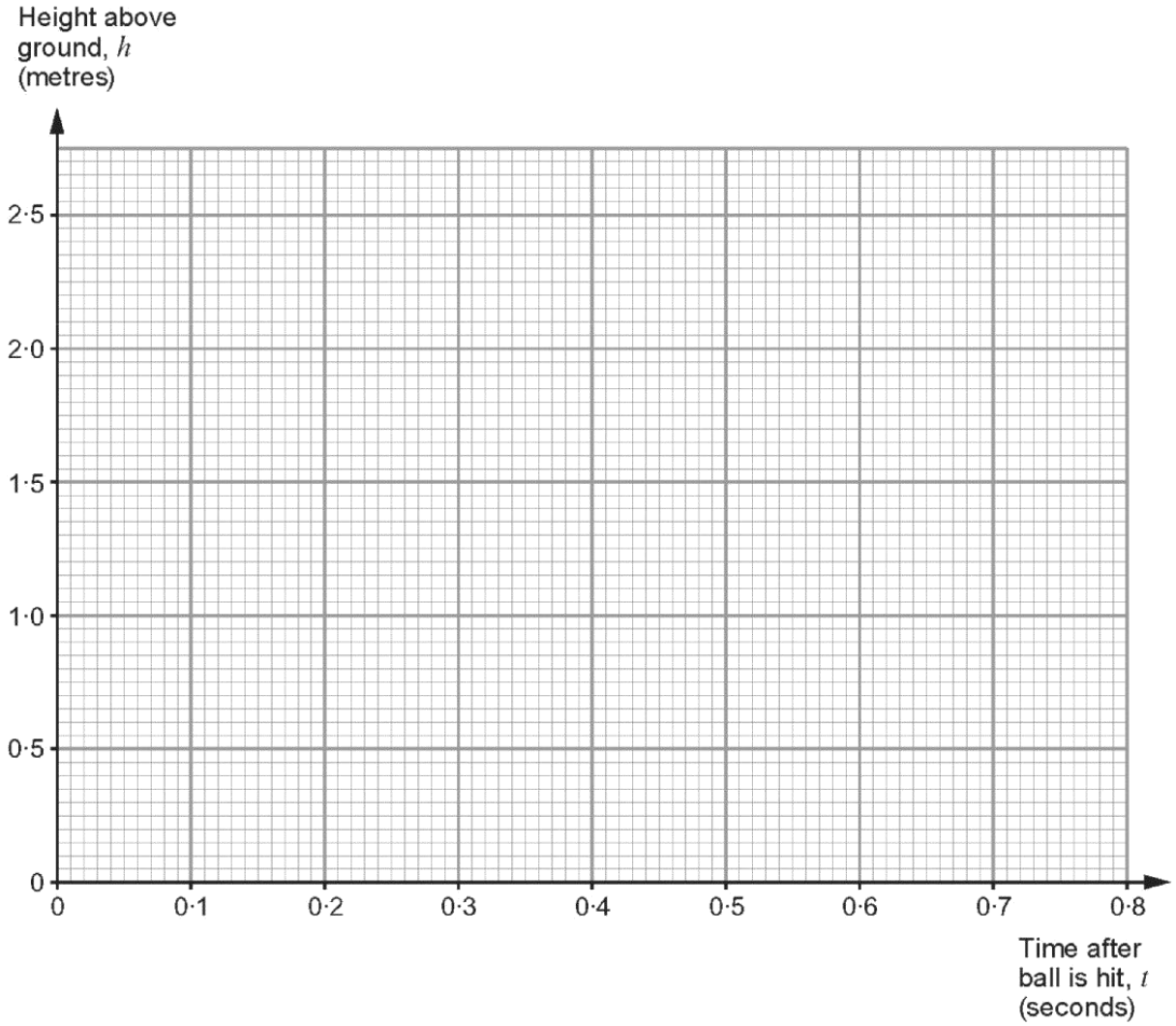
[1]

7) Stefan is practising tennis.

After a ball is hit, a camera records its height at different times.
The results are given in the following table.

Time after ball is hit, t (seconds)	0	0·1	0·2	0·3	0·4	0·5	0·6	0·7
Height above ground, h (metres)	2·2	2·25	2·2	2·05	1·8	1·45	1·0	0·45

(a) On the axes below, draw a graph to show the heights of the ball for values of t between 0 and 0·7 seconds. [3]



(b) What is the ball's height above the ground when it is hit? [1]

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(c) Use your graph to estimate for how much time the ball is more than 1·3 m above the ground after being hit. [1]

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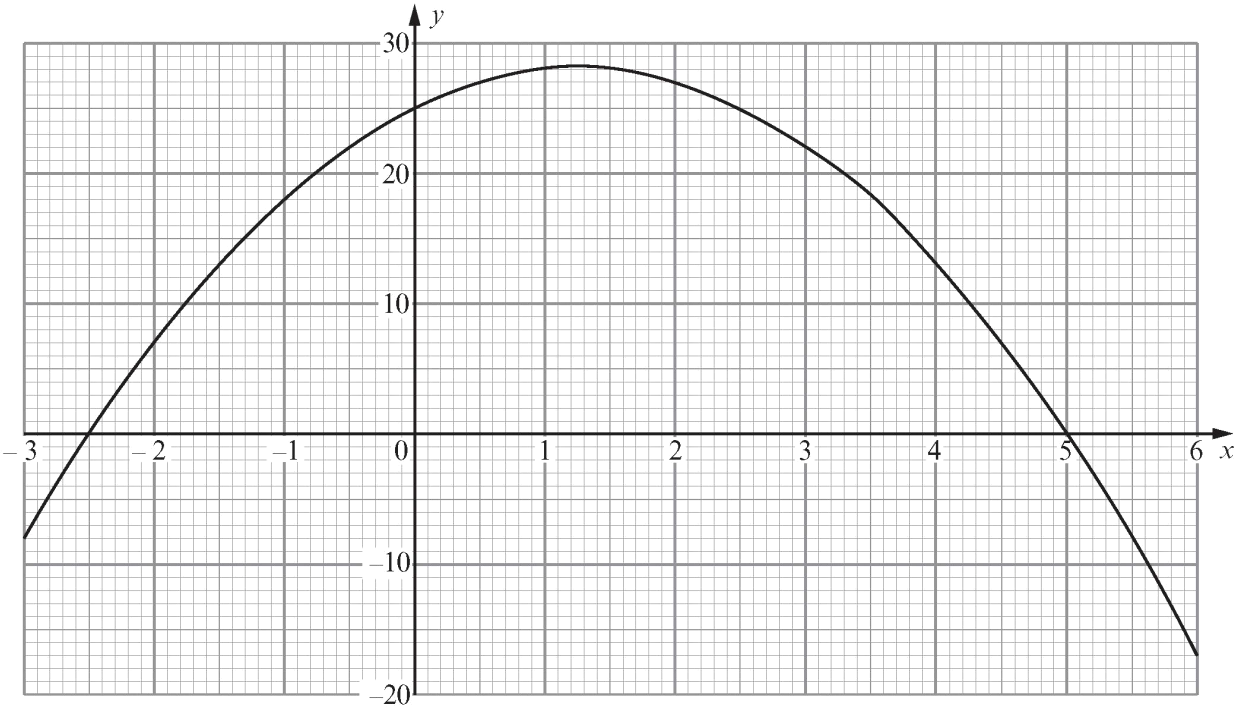
(d) Which of the following equations is a possible formula to give the height of the ball in terms of time? [1]

$h = 2{\cdot}2 + t + 5t^3$ $\quad$ $h = 2{\cdot}2 - 5t$ $\quad$ $h = 2{\cdot}2t - 5t^2$

$h = 2{\cdot}2 + t - 5t^2$ $\quad$ $h = 2{\cdot}2 + 5t^2$

The possible formula is .....

8) The graph of $y = -2x^2 + 5x + 25$ for values of x from -3 to 6 is shown below.



(a) Use the graph to solve each of the following equations.

(i) $-2x^2 + 5x + 25 = 0$

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[1]

(ii) $-2x^2 + 5x + 20 = 0$

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[2]

(b) Find the coordinates of the points of intersection of the graph of $y = -2x^2 + 5x + 25$ and the graph of $y = x^2 - 2x - 3$.

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[5]

9) Lucy is a scientist. During an investigation she needs to find the points of intersection of two equations to solve a problem.
The equations are $y = x^2 - 6x + 8$ and $x + y = 4$.
Draw graphs to solve Lucy's problem.

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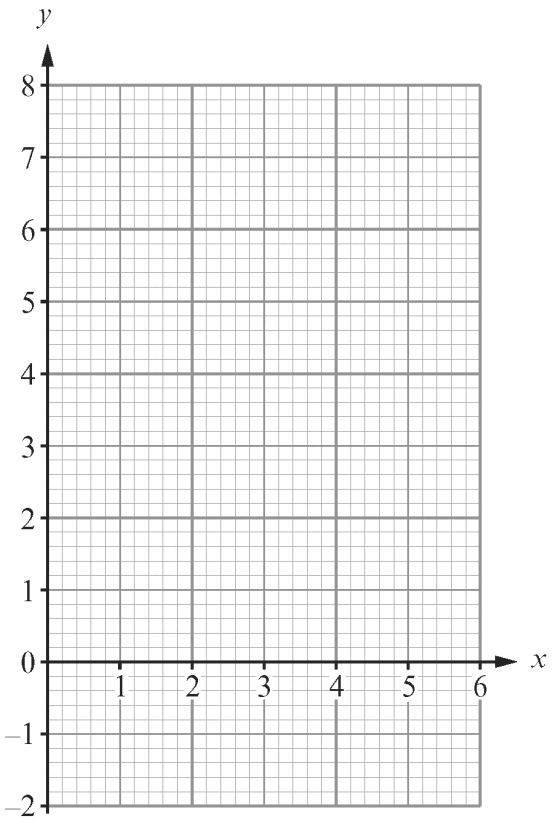

[5]

Points of intersection .....

[2]

10) The table shows some of the values of $y = 2x^2 + 3x - 9$ for values of x from -4 to 3.

(a) Complete the table below.

x	-4	-3	-2	-1	0	1	2	3
$y = 2x^2 + 3x - 9$	11	0		-10	-9	-4		18

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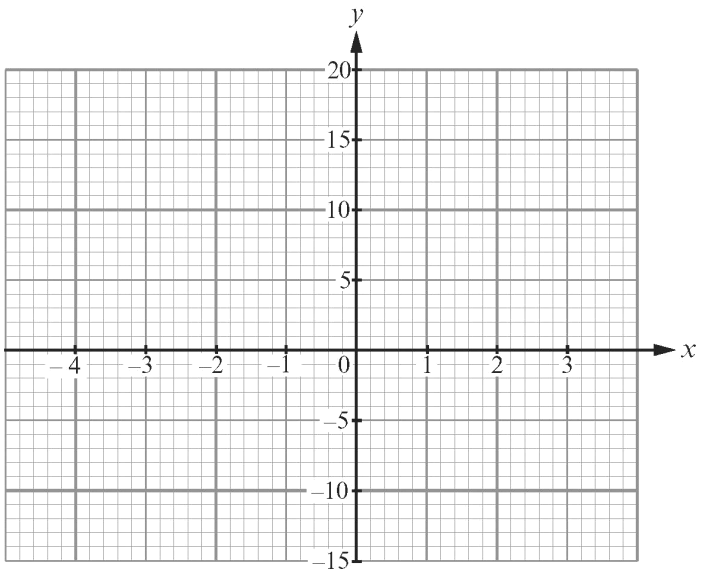
[2]

(b) On the graph paper below, draw the graph of $y = 2x^2 + 3x - 9$ for values of x from -4 to 3.



[3]

(c) Use your graph to solve $2x^2 + 3x - 9 = 0$.

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[2]

(d) Use your graph to solve $2x^2 + 3x - 9 = 6$.

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[2]

11)

(a) Complete the table below that shows some of the values of $y = x^2 - 2x - 2$, for values of x from -2 to 3. [1]

x	-2	-1	0	1	2	3
$y = x^2 - 2x - 2$	.....	1	-2	-3	-2	1

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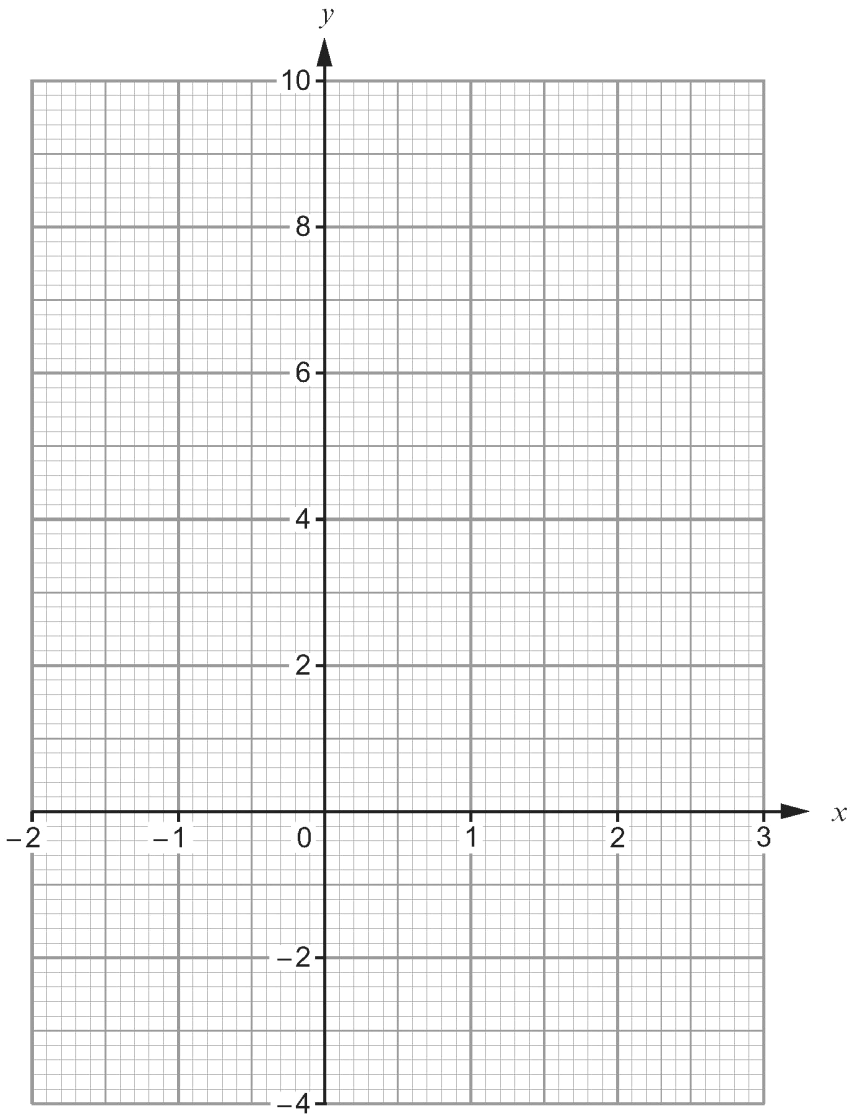
(b) On the graph paper below, draw the graph of $y = x^2 - 2x - 2$, for values of x from -2 to 3. [2]



(c) By drawing an appropriate line, solve the quadratic equation $x^2 - 2x - 2 = -x + 1$. [3]

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12) The table shows some of the values of $y = x^2 + 10x$ for values of x from –4 to 3.

x	–4	–3	–2	–1	0	1	2	3
$y = x^2 + 10x$	–24	–21		–9	0	11		39

(a) Complete the table above. [2]

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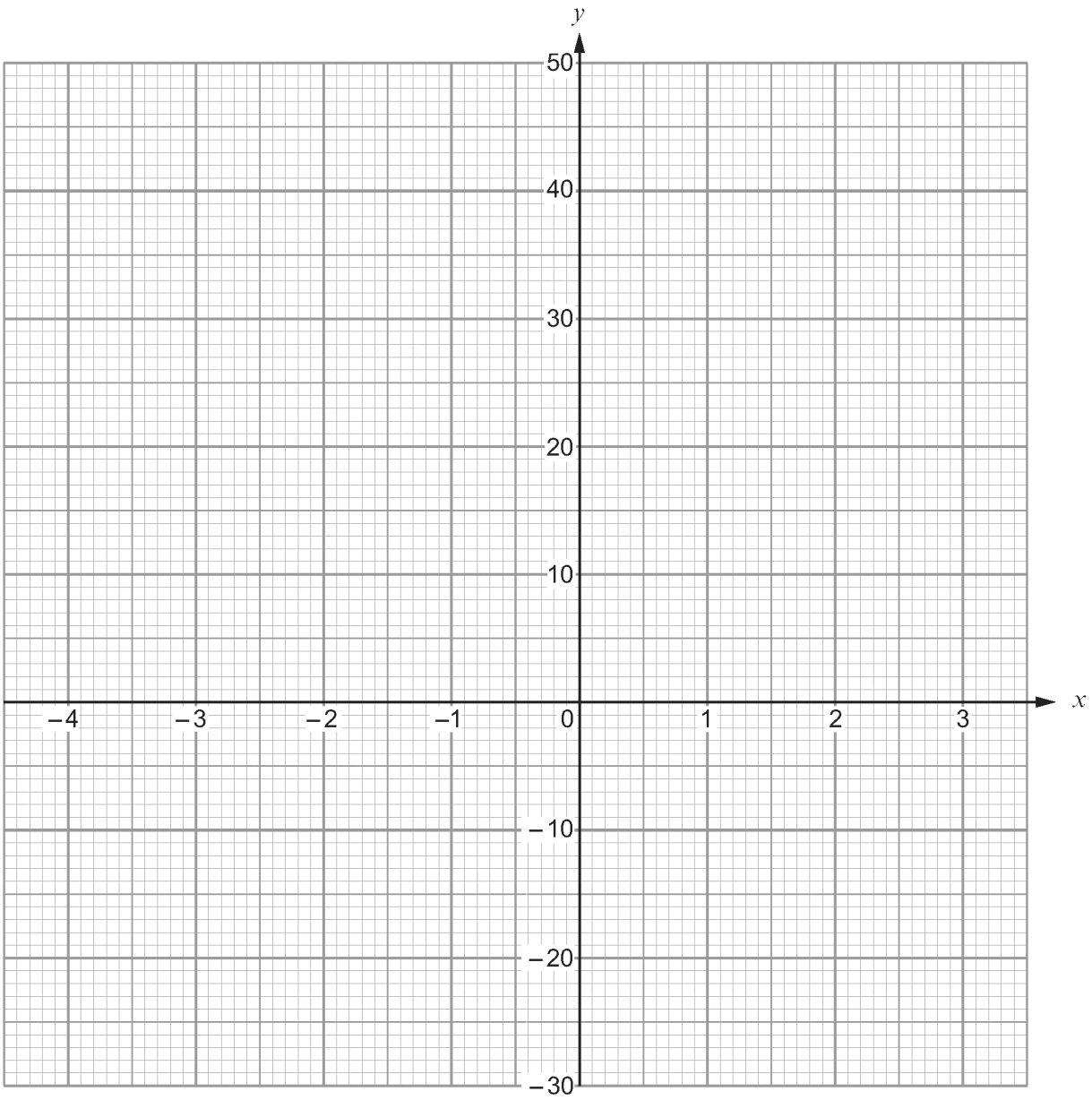
(b) On the graph paper, draw the graph of $y = x^2 + 10x$ for the values of x from –4 to 3. [2]



(c) (i) On the same axes, draw the graph of $y = -10x + 5$. [2]

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(ii) Hence, write down the coordinates of the point of intersection of $y = x^2 + 10x$ and $y = -10x + 5$. [1]

(..... , ...)

(d) Marged states,
'**The graphs of** $y = -10x - 5$ **and** $y = -10x + 5$ **are parallel.**'

Is Marged correct?
Tick the appropriate box and give a reason for your answer. [1]

Yes ☐ No ☐

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