Plotting Quadratic Graphs - Worksheet
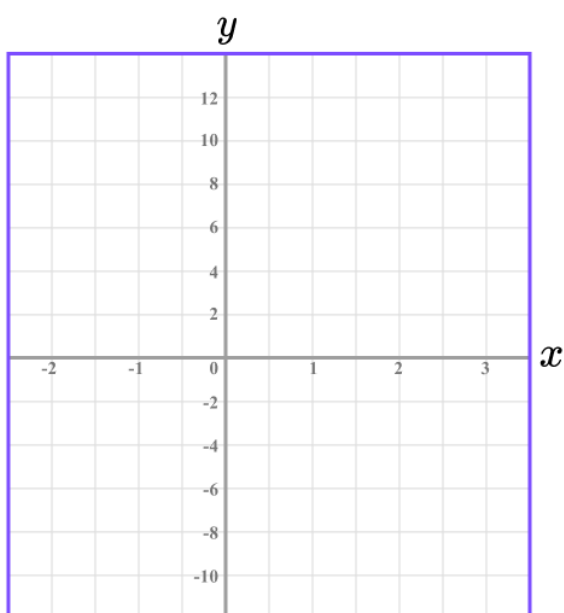
Skill

Group A - Plotting simple quadratic graphs

Complete the table of values and plot the graph on the axes provided:
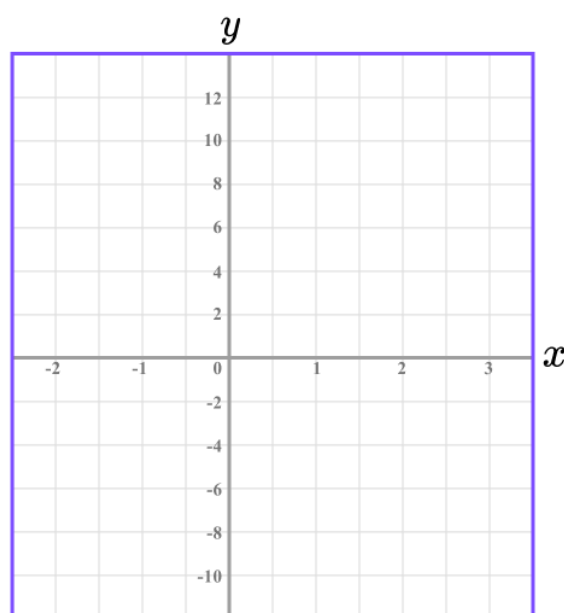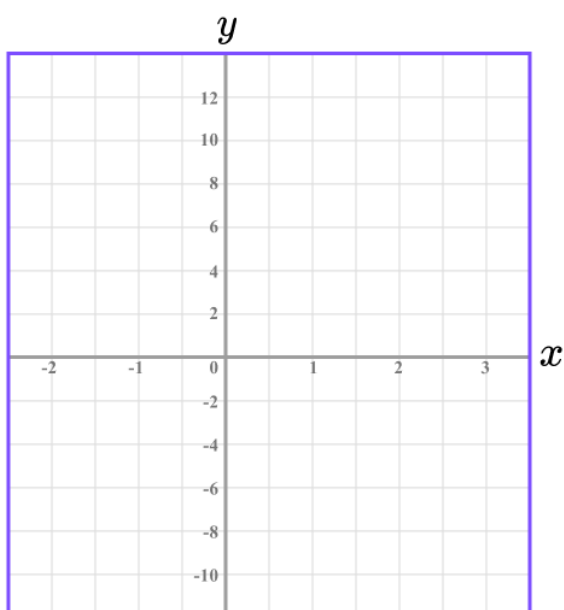
1) $y = x^2$

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

2) $y = x^2 + 1$

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

3) $y = x^2 + 2$

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

4) $y = x^2 - 1$

x	-3	-2	-1	0	1	2	3
y							
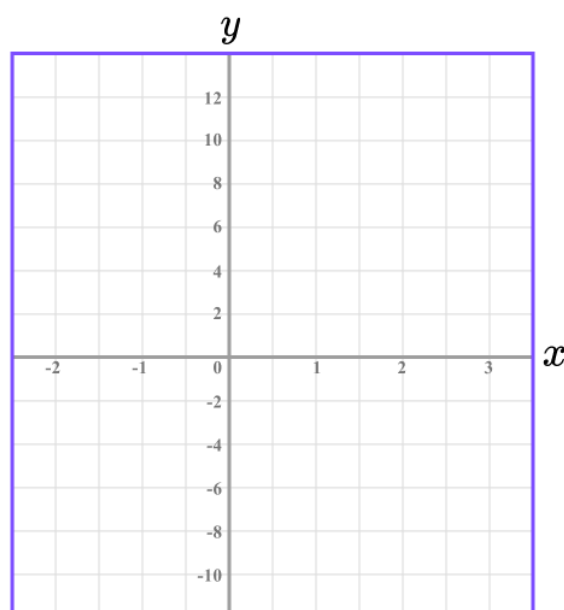
Plotting Quadratic Graphs - Worksheet

5) $y = x^2 - 2$

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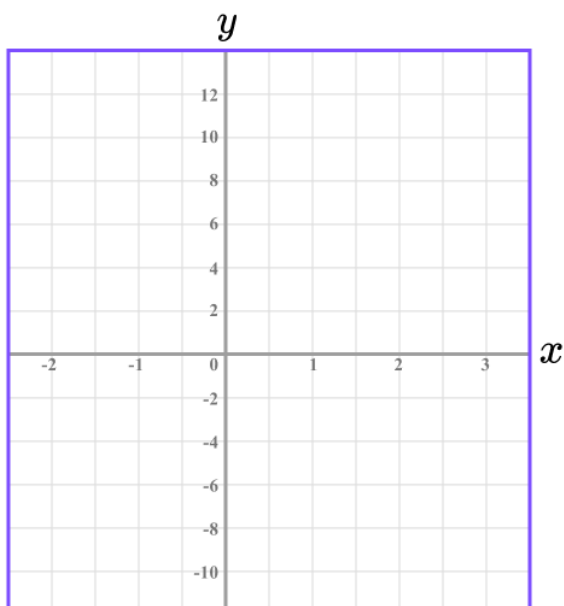
6) $y = x^2 - 3$

x	-3	-2	-1	0	1	2	3
y							
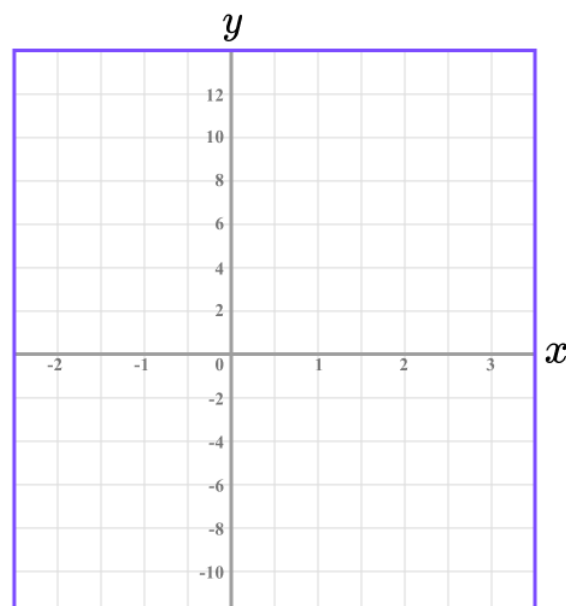
7) $y = -x^2$

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

8) $y = -x^2 + 1$

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

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2
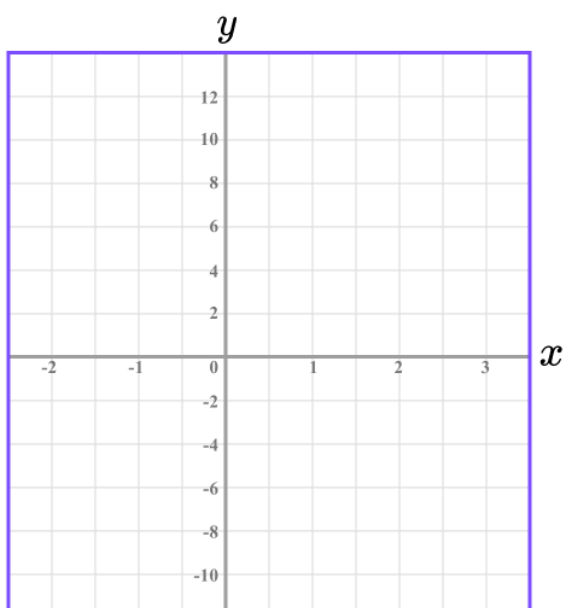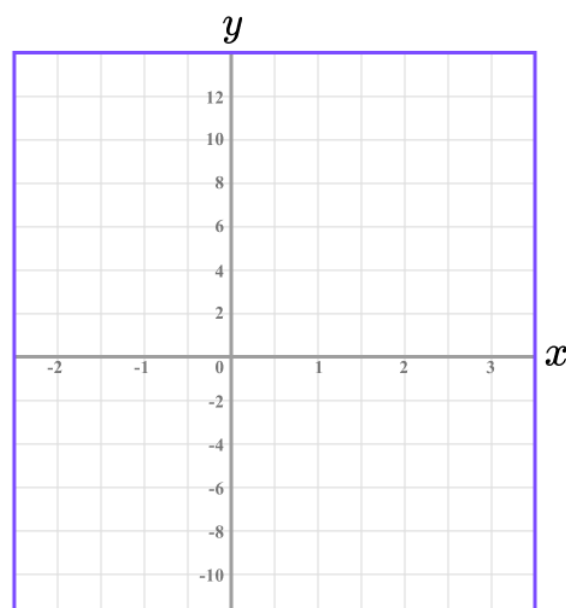
Plotting Quadratic Graphs - Worksheet

9) $y = -x^2 + 2$

x	-3	-2	-1	0	1	2	3
y							
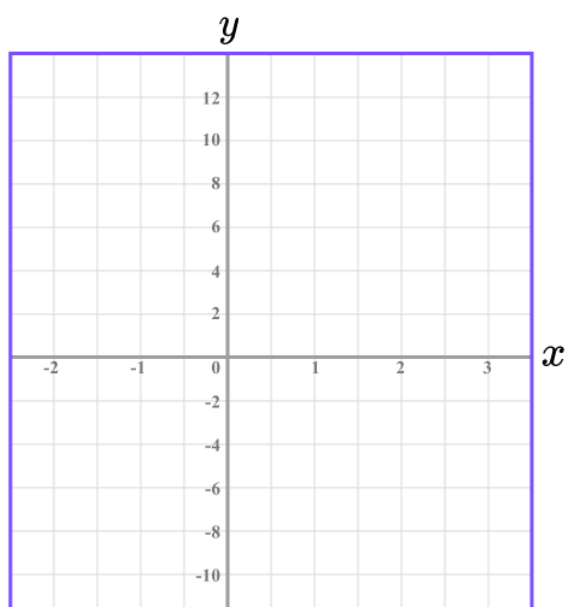
10) $y = -x^2 + 3$

x	-3	-2	-1	0	1	2	3
y							
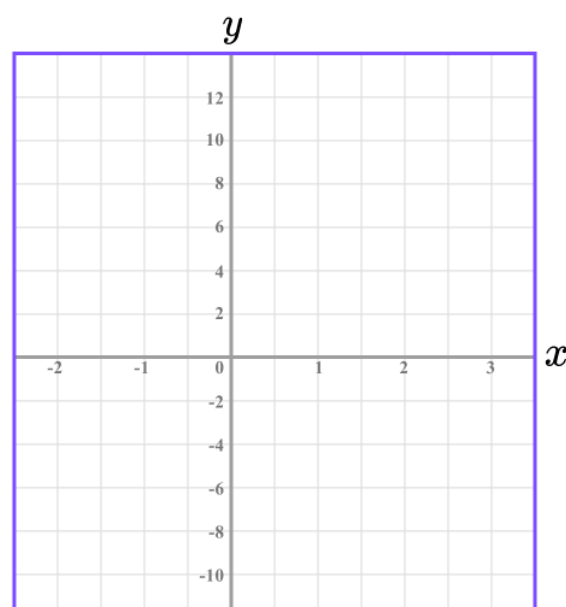
11) $y = -x^2 - 1$

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

12) $y = -x^2 - 2$

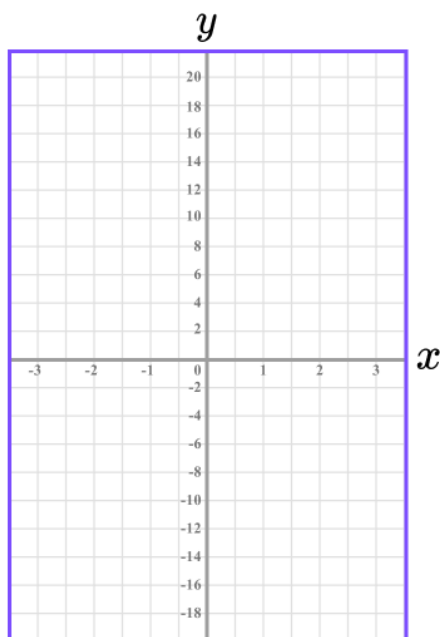| x	-3	-2	-1	0	1	2	3
y							

THIRD SPACE
LEARNING
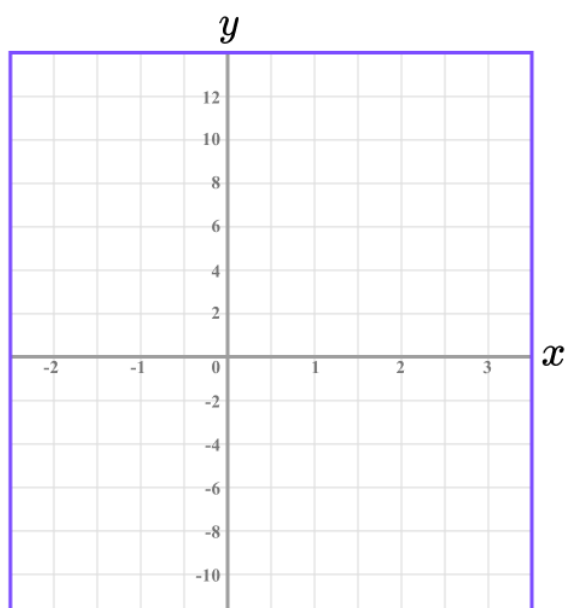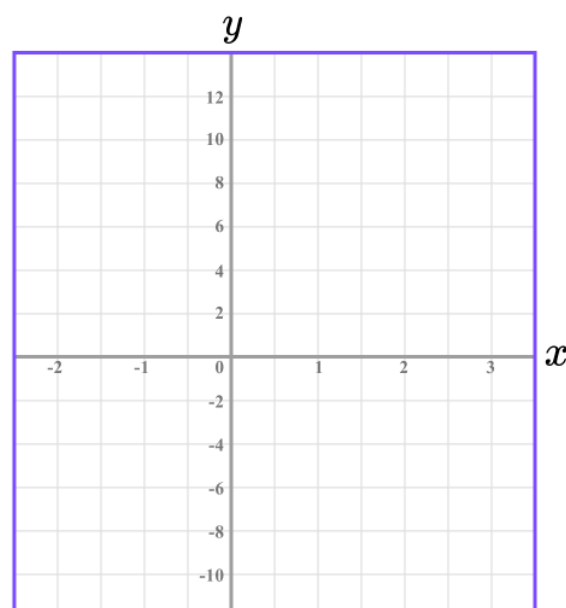
Plotting Quadratic Graphs - Worksheet

Group B - Plotting quadratic graphs

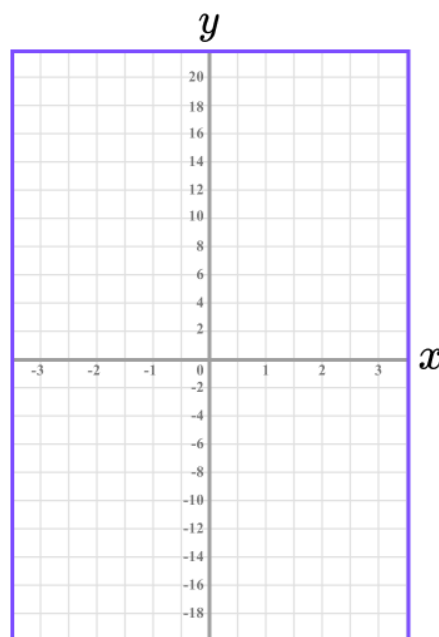Complete the table of values and plot the graph on the axes provided:
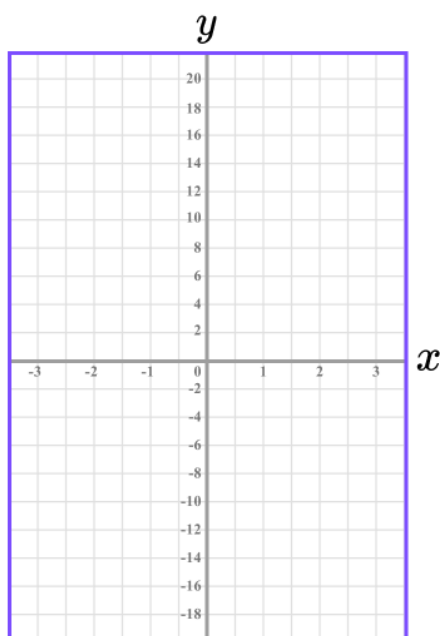
1) $y = x^2 + x$

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

2) $y = x^2 + 2x$

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

3) $y = x^2 + 3x$

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

4) $y = x^2 - x$

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

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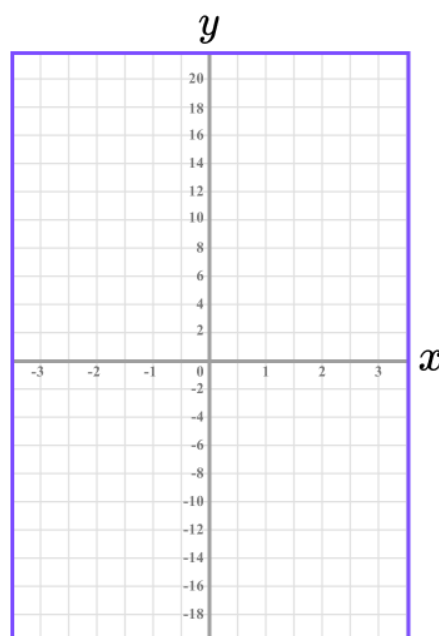
Plotting Quadratic Graphs - Worksheet

5) $y = x^2 - 2x$

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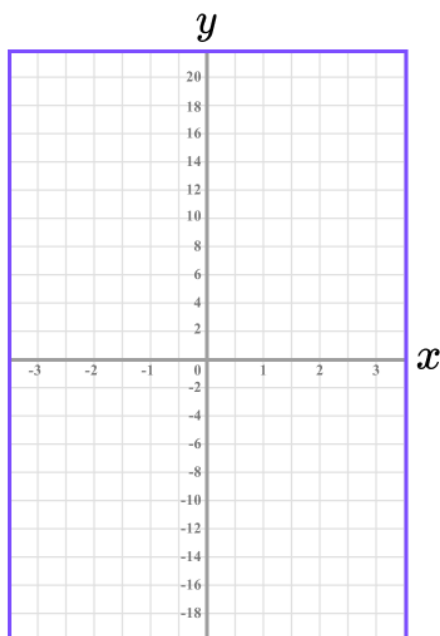
6) $y = x^2 - 3x$

x	-3	-2	-1	0	1	2	3
y							
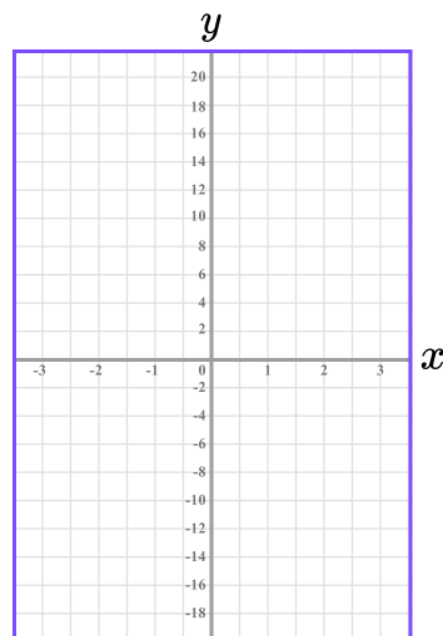
7) $y = -x^2 + x$

x	-3	-2	-1	0	1	2	3
y							
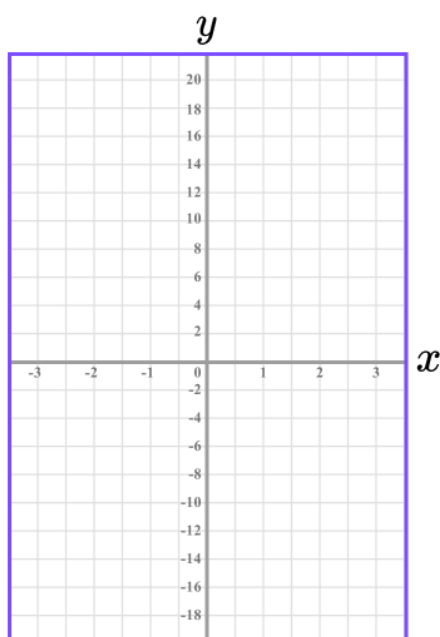
8) $y = -x^2 + 2x$

x	-3	-2	-1	0	1	2	3
y							
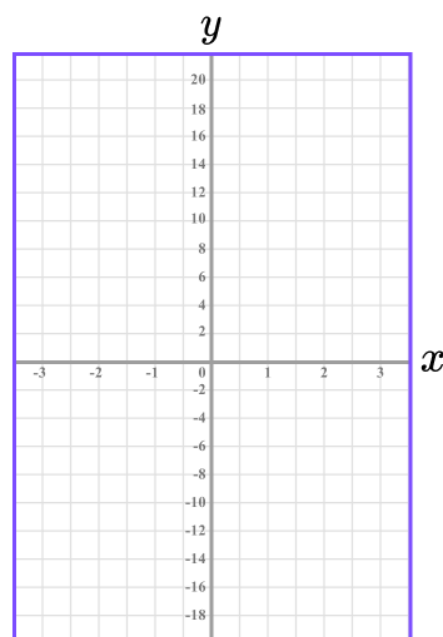
Plotting Quadratic Graphs - Worksheet

9) $y = -x^2 + 3x$

x	-3	-2	-1	0	1	2	3
y							
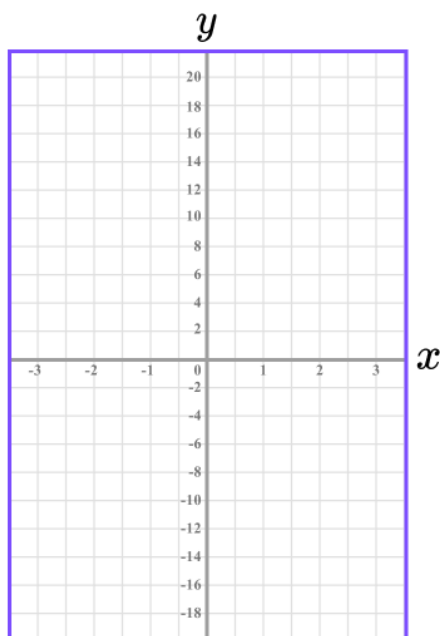
10) $y = -x^2 - x$

x	-3	-2	-1	0	1	2	3
y							
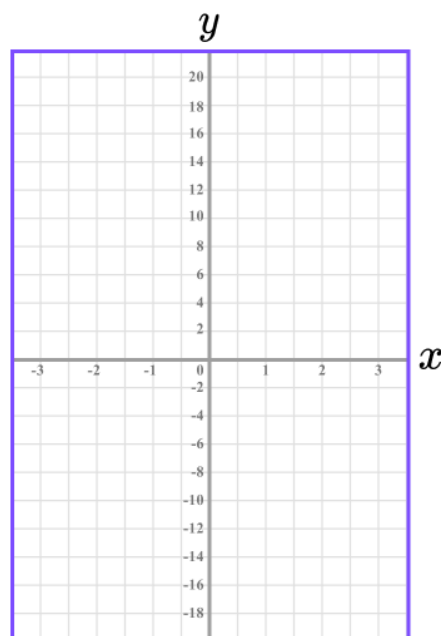
11) $y = -x^2 - 2x$

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

12) $y = -x^2 - 3x$

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

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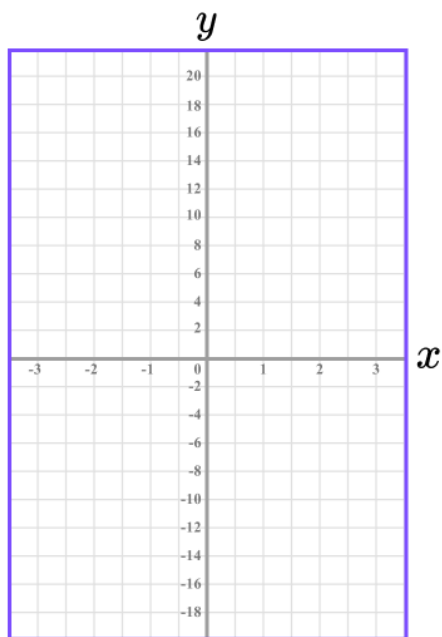
6
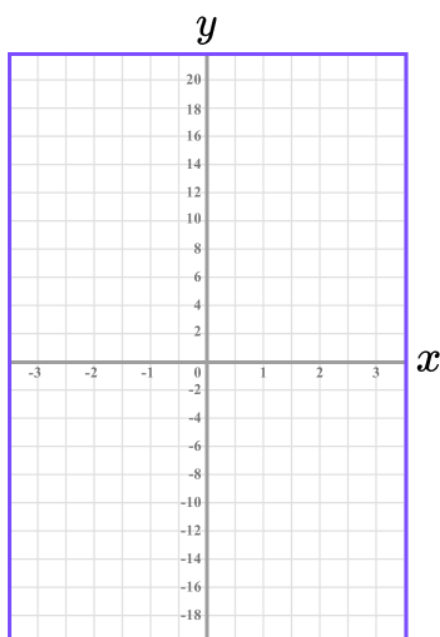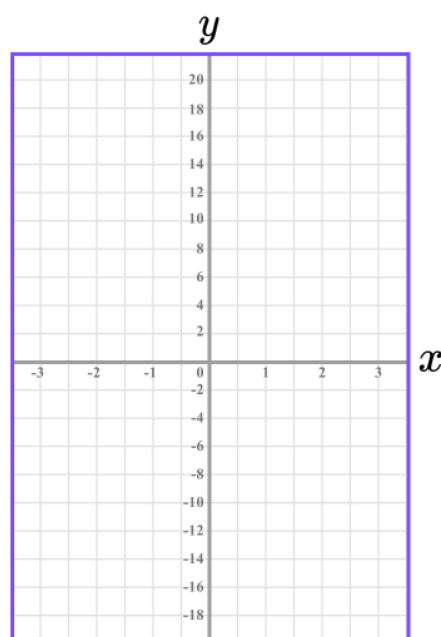
Plotting Quadratic Graphs - Worksheet

Group C - Plotting more complicated quadratic graphs

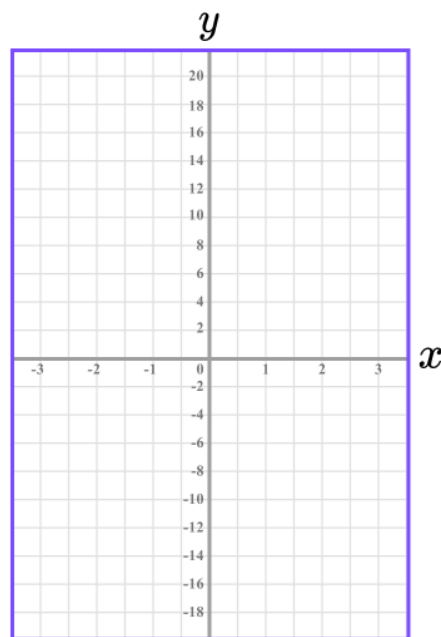Complete the table of values and plot the graph on the axes provided:

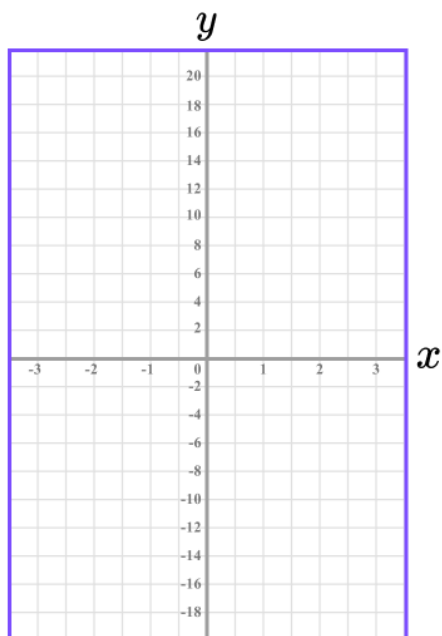**1)** $y = x^2 + x - 4$

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

2) $y = x^2 + x - 3$

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

3) $y = x^2 + x - 1$

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

4) $y = x^2 + 2x - 4$

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

THIRD SPACE
LEARNING
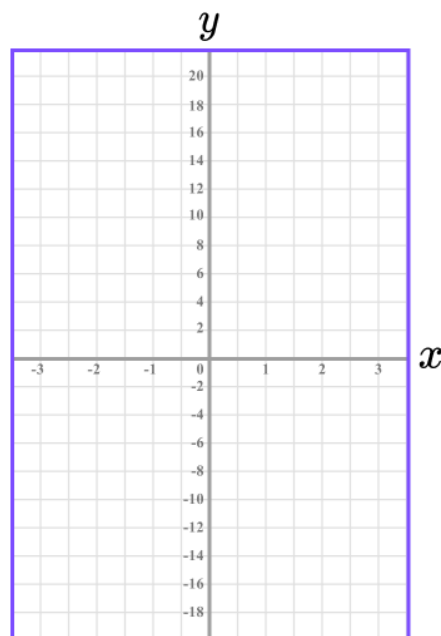
Plotting Quadratic Graphs - Worksheet

5) $y = x^2 + 2x - 3$

x	-3	-2	-1	0	1	2	3
y							
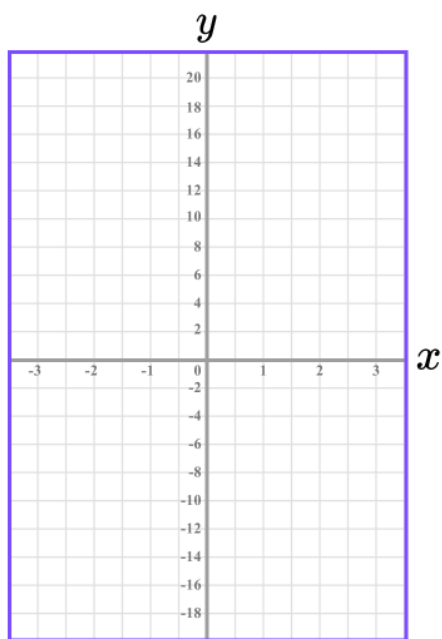
6) $y = x^2 + 2x - 1$

x	-3	-2	-1	0	1	2	3
y							
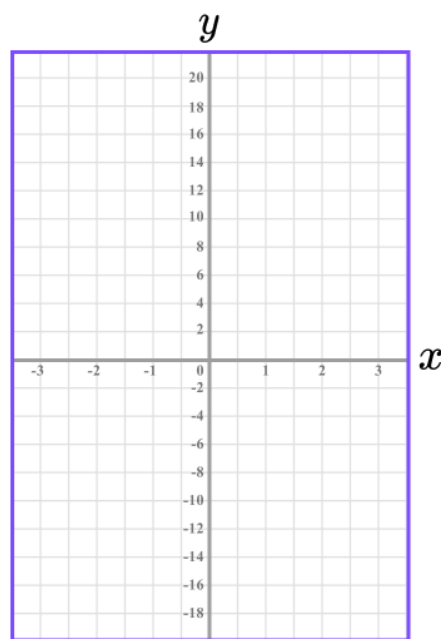
7) $y = x^2 + 3x - 4$

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

8) $y = x^2 + 3x - 3$

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

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THIRD SPACE
LEARNING
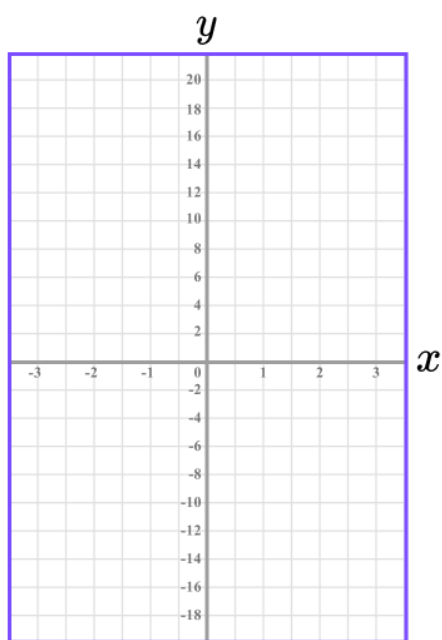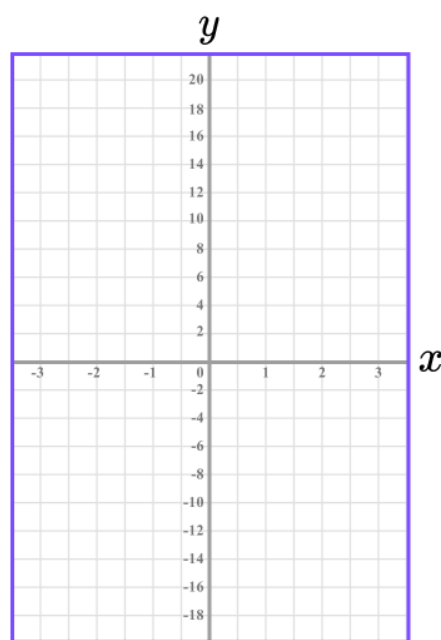
Plotting Quadratic Graphs - Worksheet

9) $y = x^2 + 3x - 1$

x	-3	-2	-1	0	1	2	3
y							
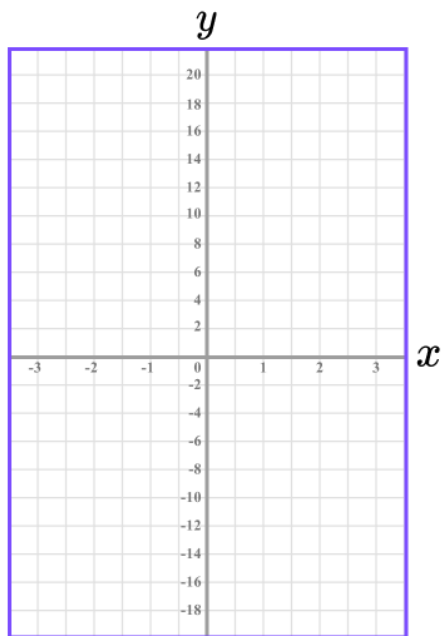
10) $y = 2x^2 + x - 4$

x	-3	-2	-1	0	1	2	3
y							
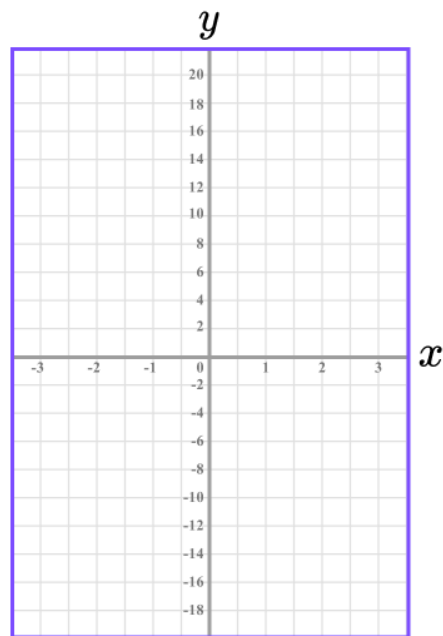
11) $y = 2x^2 + x - 3$

x	-3	-2	-1	0	1	2	3
y							
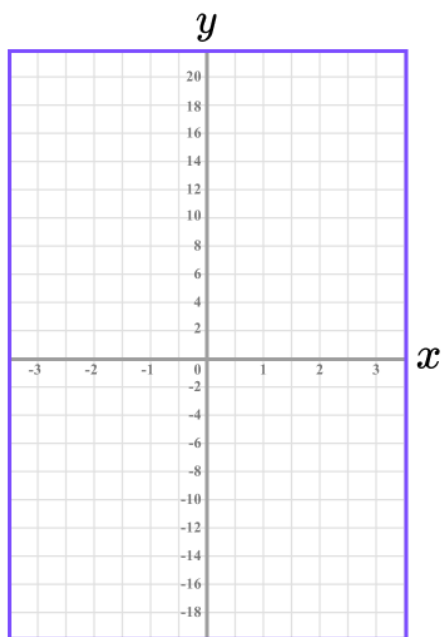
12) $y = 2x^2 + x - 1$

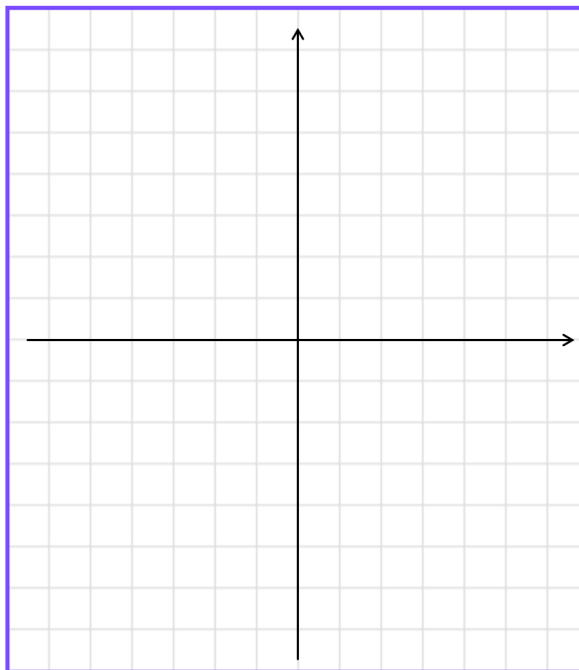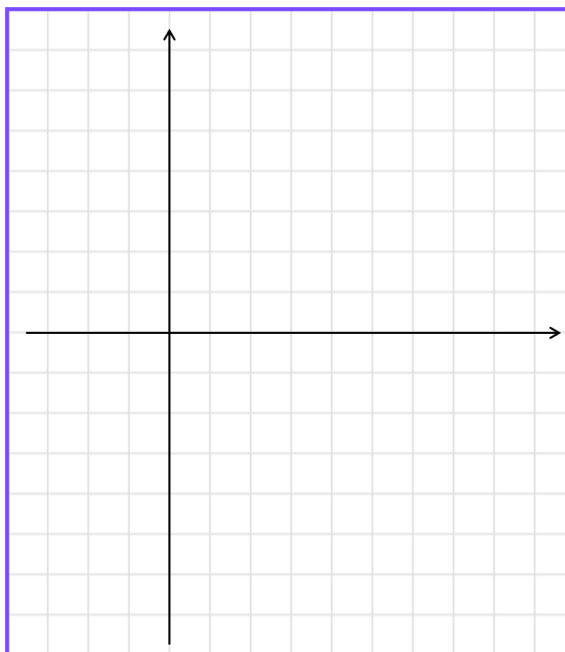| x	-3	-2	-1	0	1	2	3
y							
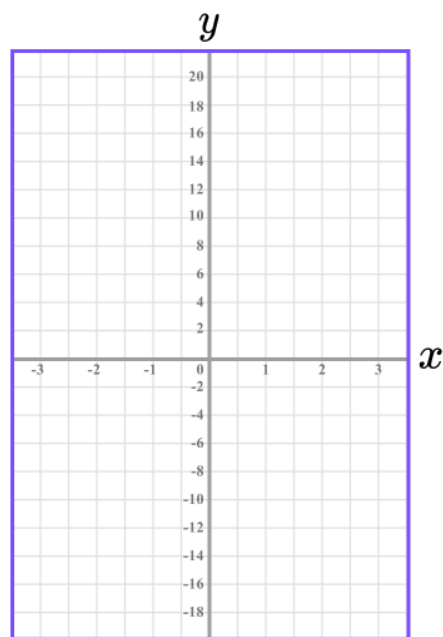
Plotting Quadratic Graphs - Worksheet

Applied

1) Draw the graph of $y = x^2 + 4x - 10$, for the values of x from -3 to 3, on the grid below.
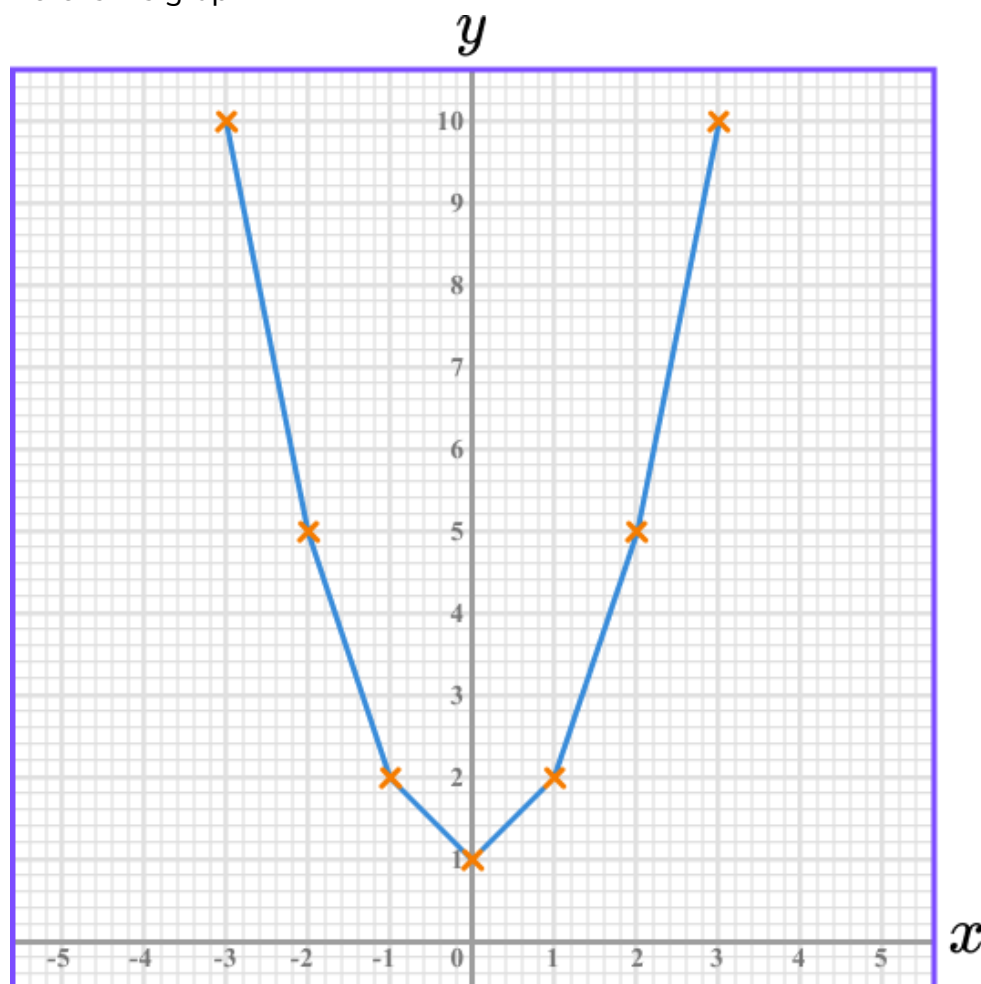

2) **(a)** Complete a table of values for $y = (x - 2)(x - 3)$ for the values of x from -1 to 4.

(b) Complete a table of values for $y = (3 - x)(x + 1)$ for the values of x from -1 to 4.

(c) Draw both graphs on the grid for the values of x from -1 to 4.

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Plotting Quadratic Graphs - Worksheet

3)   Robert has drawn the graph of $y = x^2 + 1$.

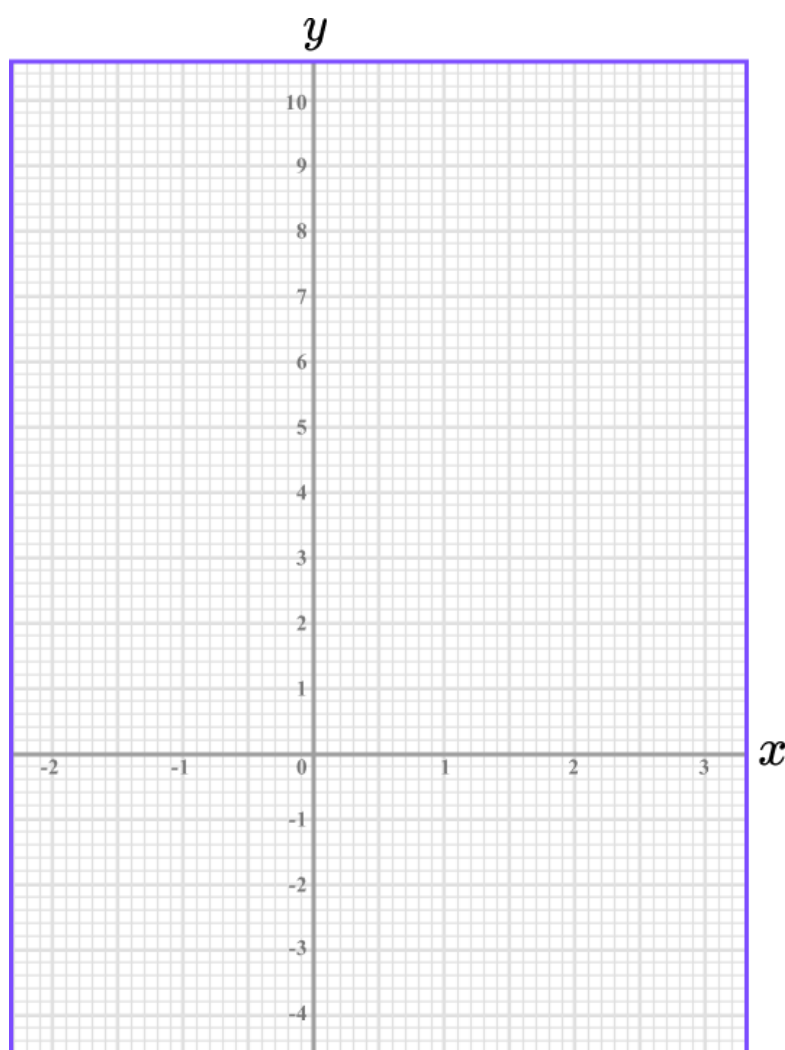Here is his graph.

Make one criticism of Robert's graph.

Plotting Quadratic Graphs - Exam Questions

1) **(a)** Complete the table of values for $y = x^2 - 3$.

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

(2)

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

(2)

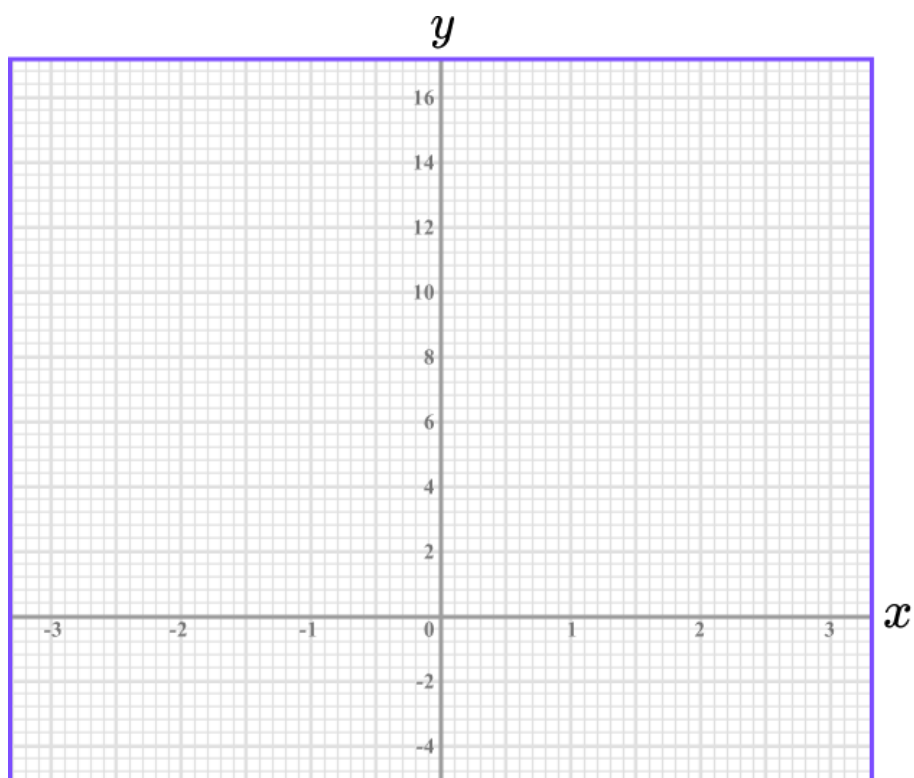**(c)** Use your graph to find the minimum value of y.

....

(1)

(5 marks)

Plotting Quadratic Graphs - Exam Questions

2) **(a)** Complete the table of values for $y = x^2 + 2x - 1$.

x	-3	-2	-1	0	1	2	3
y	2			-1			14

(2)

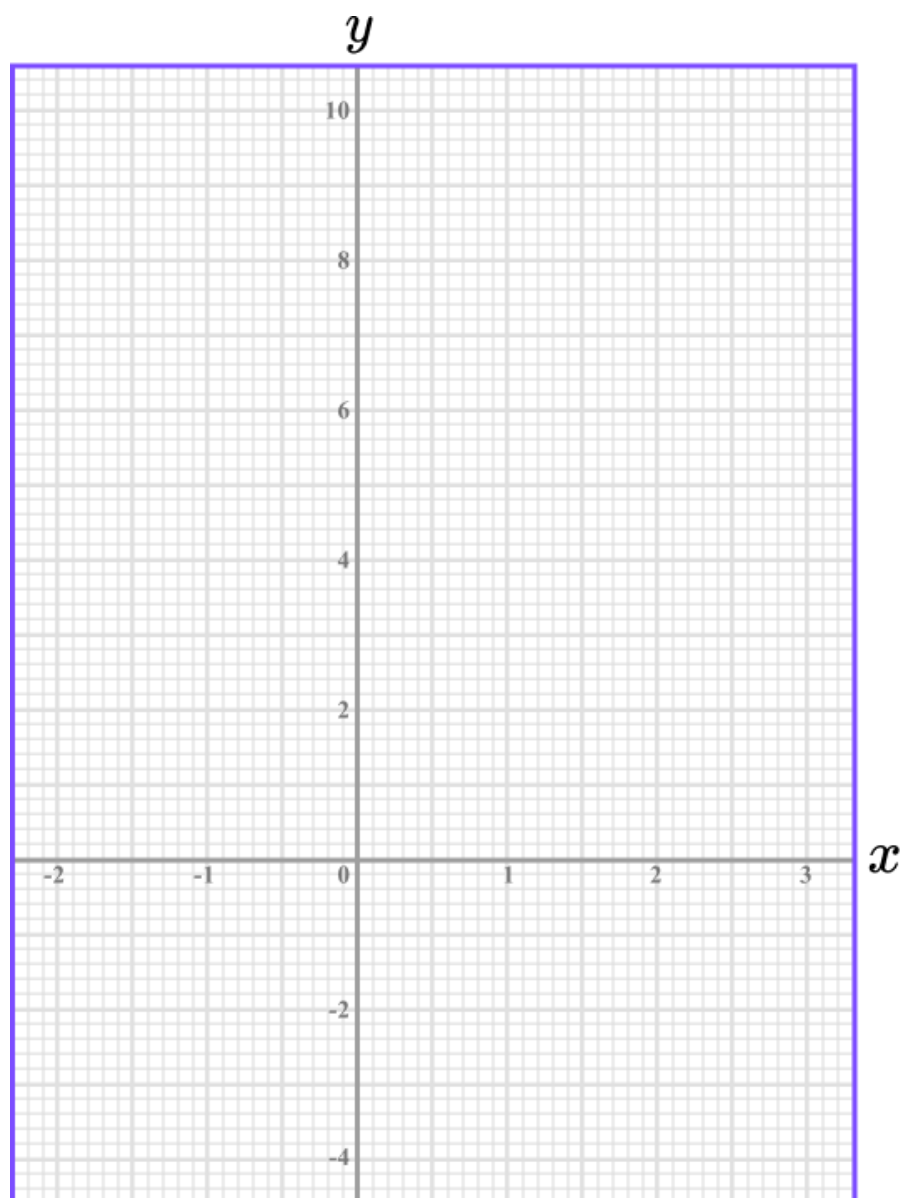**(b)** On the grid, draw the graph of $y = x^2 + 2x - 1$ for the values of x from $- 2$ to 3.

(2)

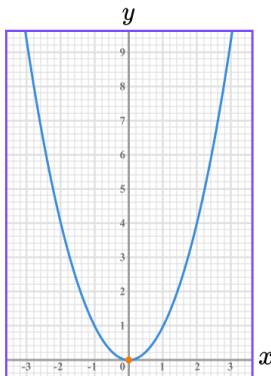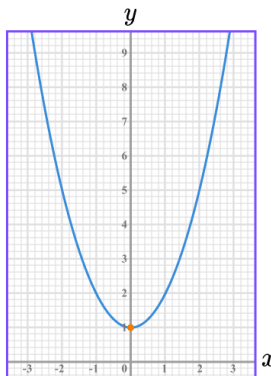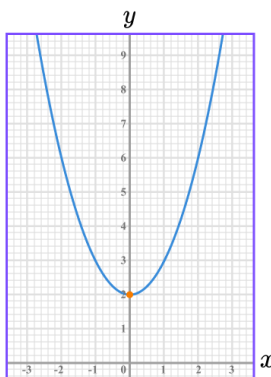**(c)** Use your graph to identify the roots of the equation $x^2 + 2x - 1 = 0$

....

(2)

(6 marks)

Plotting Quadratic Graphs - Exam Questions

3) On the grid, draw the graph of $y = x^2 - 3x - 1$.

(3 marks)

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Plotting Quadratic Graphs - Answers

	Question	Answer
	Skill Questions	
Group A	Complete the table of values and plot the graph on the axes provided: **1)** $y = x^2$	**1)**
	2) $y = x^2 + 1$	**2)**
	3) $y = x^2 + 2$	**3)**

1)

x	-3	-2	-1	0	1	2	3
y	9	4	1	0	1	4	9

2)

x	-3	-2	-1	0	1	2	3
y	10	5	2	1	2	5	10

3)

x	-3	-2	-1	0	1	2	3
y	11	6	3	2	3	6	11

Plotting Quadratic Graphs - Answers

Group A contd	**4)** $y = x^2 - 1$	**4)**

4)

x	-3	-2	-1	0	1	2	3
y	8	3	0	-1	0	3	8
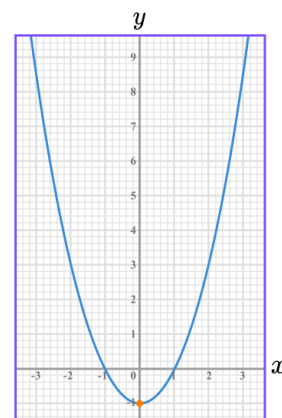
5) $y = x^2 - 2$

5)

x	-3	-2	-1	0	1	2	3
y	7	2	-1	-2	-1	2	7
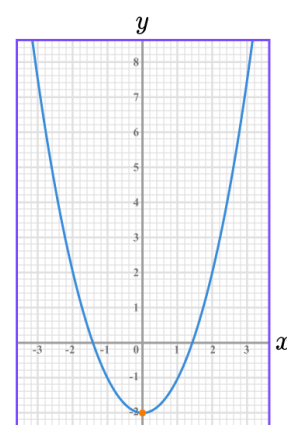
6) $y = x^2 - 3$

6)

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

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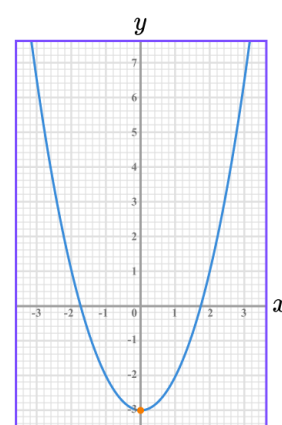
Plotting Quadratic Graphs - Answers

Group A contd	**7)** $y = -x^2$	**7)**							

7)

x	-3	-2	-1	0	1	2	3
y	-9	-4	-1	0	-1	-4	-9

8) $y = -x^2 + 1$

8)

x	-3	-2	-1	0	1	2	3
y	-8	-3	0	1	0	-3	-8

9) $y = -x^2 + 2$
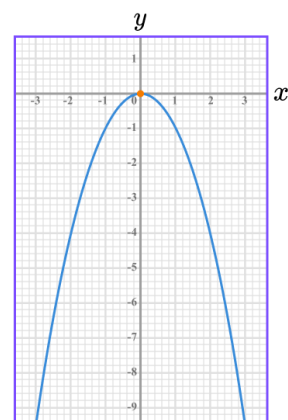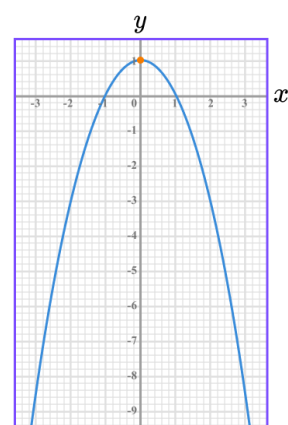
9)

x	-3	-2	-1	0	1	2	3
y	-7	-2	1	2	1	-2	-7

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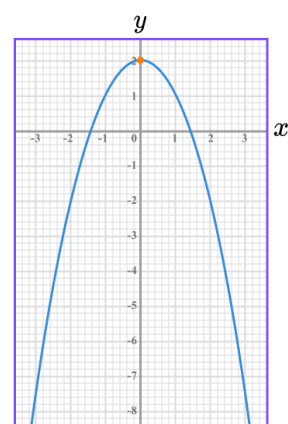
Plotting Quadratic Graphs - Answers

Group A contd	**10)** $y = -x^2 + 3$	**10)**

x	-3	-2	-1	0	1	2	3
y	-6	-1	2	3	2	-1	-6
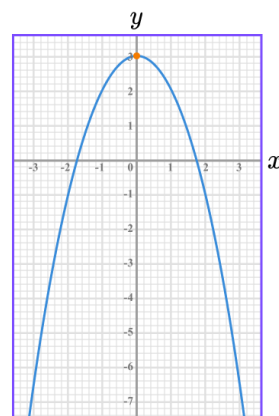
11) $y = -x^2 - 1$

11)

x	-3	-2	-1	0	1	2	3
y	-10	-5	-2	-1	-2	-5	-10
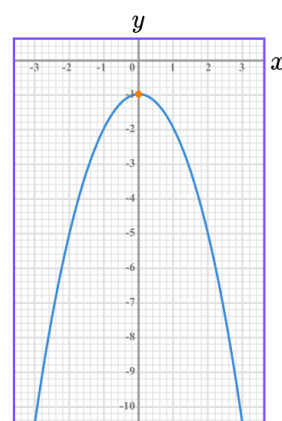
12) $y = -x^2 - 2$

12)

x	-3	-2	-1	0	1	2	3
y	-11	-6	-3	-2	-3	-6	-11

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18
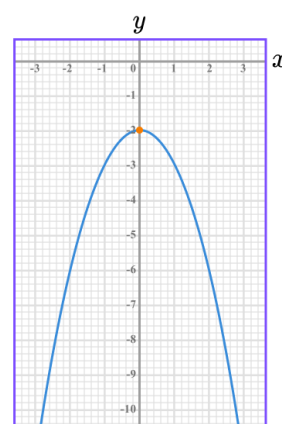
Plotting Quadratic Graphs - Answers

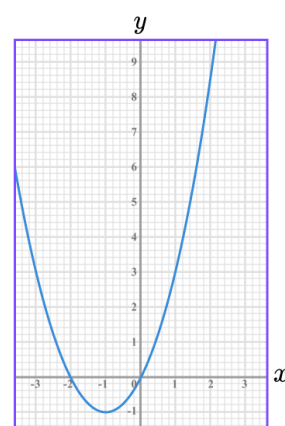| Group B	Complete the table of values and plot the graph on the axes provided:

1) $y = x^2 + x$

2) $y = x^2 + 2x$

3) $y = x^2 + 3x$

1)

x	-3	-2	-1	0	1	2	3
y	6	2	0	0	2	6	12
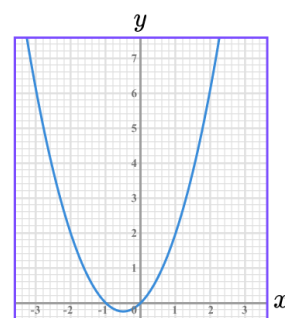
2)

x	-3	-2	-1	0	1	2	3
y	3	0	-1	0	3	8	15

3)

x	-3	-2	-1	0	1	2	3
y	0	-2	-2	0	4	10	18
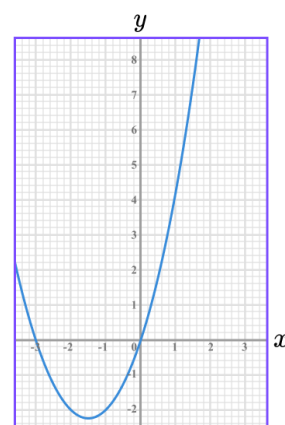
Plotting Quadratic Graphs - Answers

| Group B | **4)** $y = x^2 - x$ | **4)** |

x	-3	-2	-1	0	1	2	3
y	12	6	2	0	0	2	6
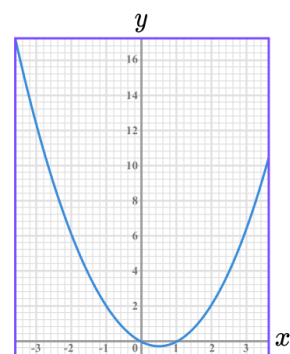
5) $y = x^2 - 2x$

5)

x	-3	-2	-1	0	1	2	3
y	15	8	3	0	-1	0	3
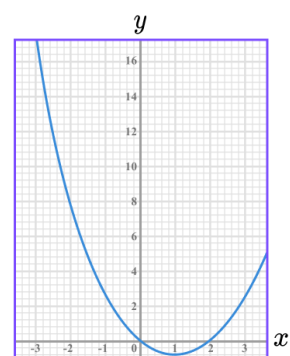
6) $y = x^2 - 3x$

6)

x	-3	-2	-1	0	1	2	3
y	18	10	4	0	-2	-2	0

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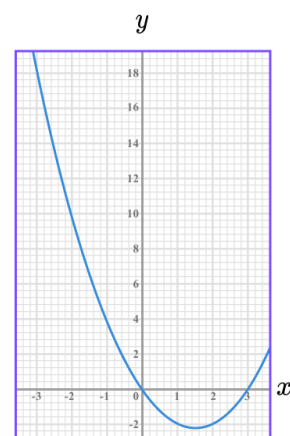
Plotting Quadratic Graphs - Answers

Group B contd	**7)** $y = -x^2 + x$	**7)**

x	-3	-2	-1	0	1	2	3
y	-12	-6	-2	0	0	-2	-6
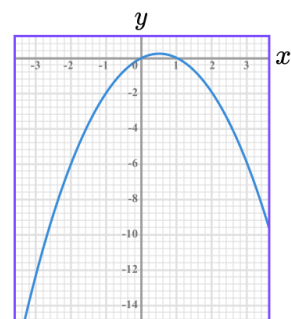
8) $y = -x^2 + 2x$

8)

x	-3	-2	-1	0	1	2	3
y	-15	-8	-3	0	1	0	-3
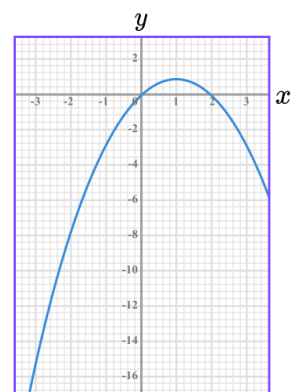
9) $y = -x^2 + 3x$

9)

x	-3	-2	-1	0	1	2	3
y	-18	-10	-4	0	2	2	0
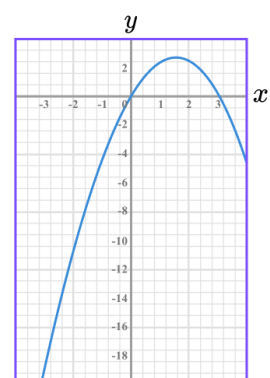
Plotting Quadratic Graphs - Answers

Group B contd	**10)** $y = -x^2 - x$	**10)**

10)

x	-3	-2	-1	0	1	2	3
y	-6	-2	0	0	-2	-6	-12

11) $y = -x^2 - 2x$
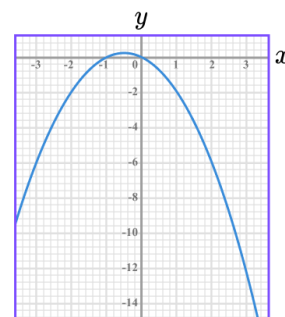
11)

x	-3	-2	-1	0	1	2	3
y	-3	0	1	0	-3	-8	-15

12) $y = -x^2 - 3x$

12)

x	-3	-2	-1	0	1	2	3
y	0	2	2	0	-4	-10	-18

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THIRD SPACE
LEARNING
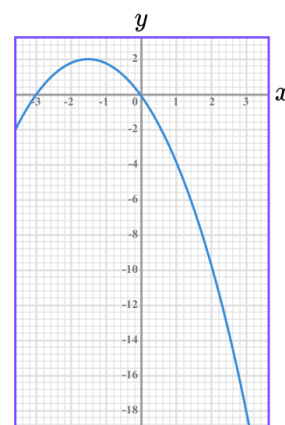
Plotting Quadratic Graphs - Answers

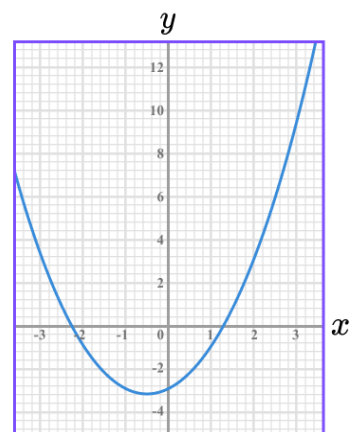| Group C	Complete the table of values and plot the graph on the axes provided:	
	1) $y = x^2 + x - 4$	**1)**

x	-3	-2	-1	0	1	2	3
y	2	-2	-4	-4	-2	2	8
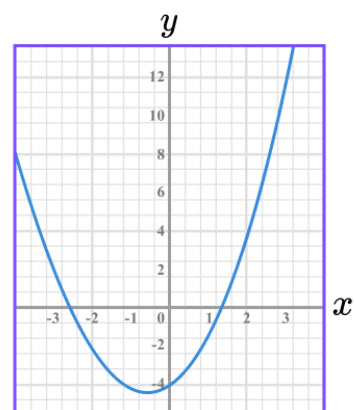
2) $y = x^2 + x - 3$

2)

x	-3	-2	-1	0	1	2	3
y	3	-1	-3	-3	-1	3	9

3) $y = x^2 + x - 1$

3)

x	-3	-2	-1	0	1	2	3
y	5	1	-1	-1	1	5	11

THIRD SPACE
LEARNING
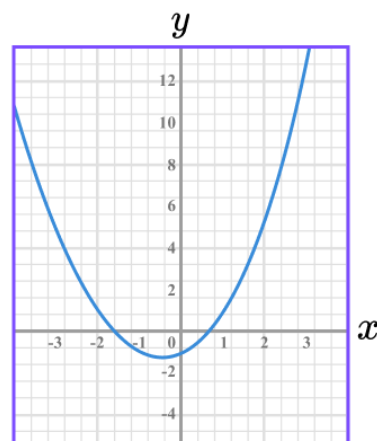
Plotting Quadratic Graphs - Answers

Group C contd	**4)** $y = x^2 + 2x - 4$	**4)**

4)

x	-3	-2	-1	0	1	2	3
y	-1	-4	-5	-4	-1	4	11
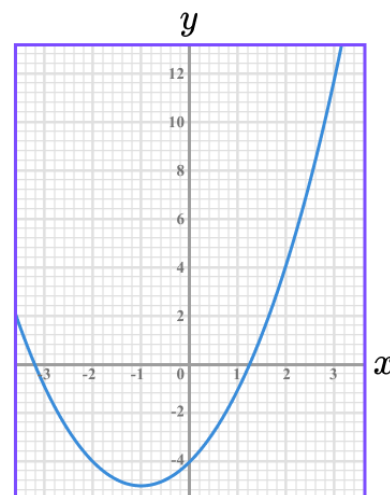
5) $y = x^2 + 2x - 3$

5)

x	-3	-2	-1	0	1	2	3
y	0	-3	-4	-3	0	5	12

6) $y = x^2 + 2x - 1$

6)

x	-3	-2	-1	0	1	2	3
y	2	-1	-2	-1	2	7	14

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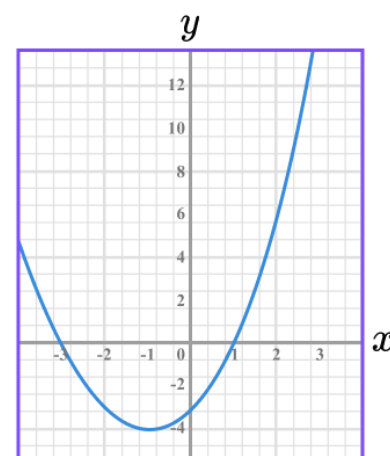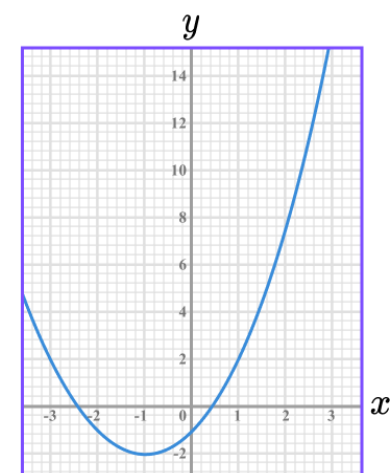
Plotting Quadratic Graphs - Answers

Group C contd	**7)** $y = x^2 + 3x - 4$	**7)**

7)

x	-3	-2	-1	0	1	2	3
y	-4	-6	-6	-4	0	6	14

8) $y = x^2 + 3x - 3$
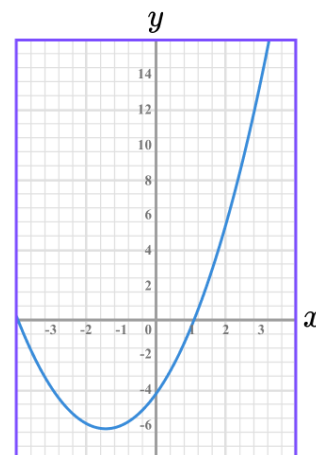
8)

x	-3	-2	-1	0	1	2	3
y	-3	-5	-5	-3	1	7	15

9) $y = x^2 + 3x - 1$
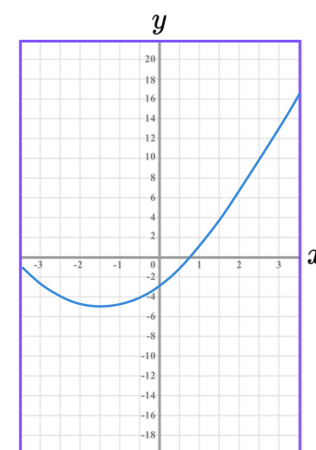
9)

x	-3	-2	-1	0	1	2	3
y	-1	-3	-3	-1	3	9	17
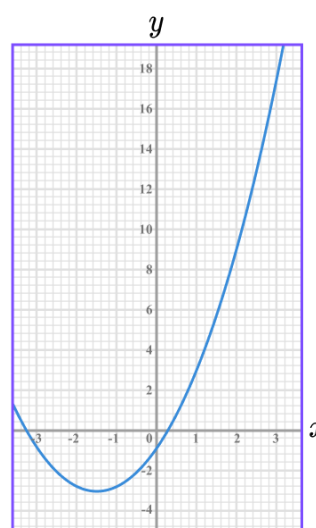
Plotting Quadratic Graphs - Answers

Group C contd	**10)** $y = 2x^2 + x - 4$	**10)**

10)

x	-3	-2	-1	0	1	2	3
y	11	2	-3	-4	-1	6	17

11) $y = 2x^2 + x - 3$
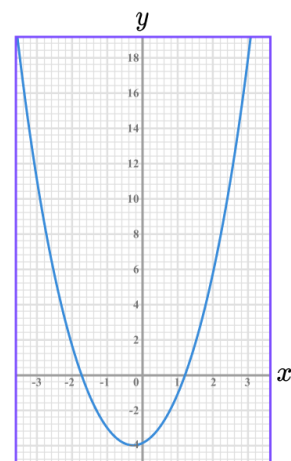
11)

x	-3	-2	-1	0	1	2	3
y	12	3	-2	-3	0	7	18

12) $y = 2x^2 + x - 1$

12)

x	-3	-2	-1	0	1	2	3
y	14	5	0	-1	2	9	20

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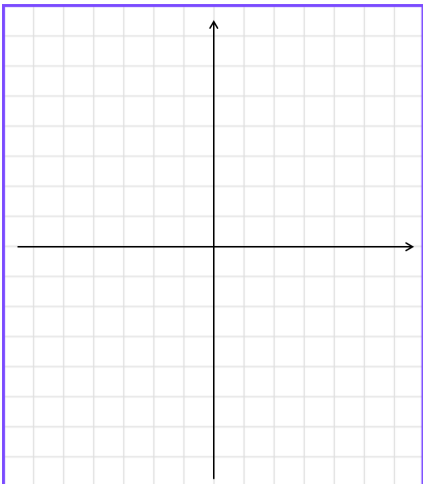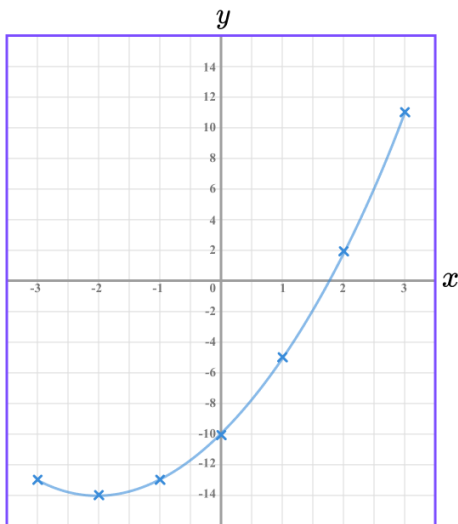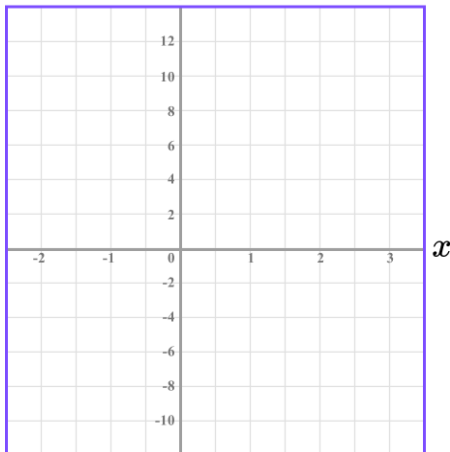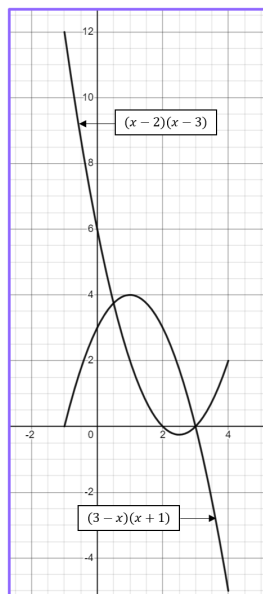
Plotting Quadratics Graphs - Answers

	Question	Answer
	Applied Questions	

1) Draw the graph of $y = x^2 + 4x - 10$, for the values of x from -3 to 3, on the grid below.

x	-3	-2	-1	0	1	2	3
y	-13	-14	-13	-10	-5	2	11

2)

a) Complete a table of values for $y = (x - 2)(x - 3)$ for the values of x from -1 to 4.

$(x - 2)(x - 3) = x^2 - 5x + 6$

x	-1	0	1	2	3	4
y	12	6	2	0	0	2

b) Complete a table of values for $y = (3 - x)(x + 1)$ for the values of x from -1 to 4.

$(3 - x)(x + 1) = -x^2 + 2x + 3$

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

c) Draw both graphs on the grid for the values of x from -1 to 4.

Plotting Quadratics Graphs - Answers

3) Robert has drawn the graph of $y = x^2 + 1$.

Here is his graph.
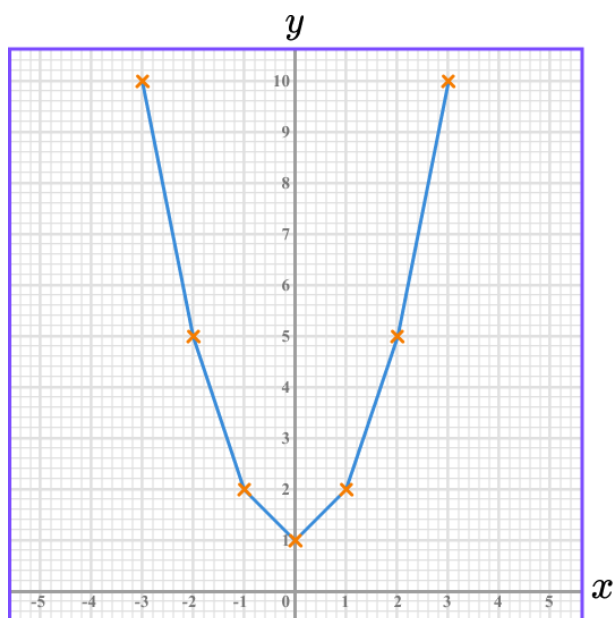
Make one criticism of Robert's graph.

It should be a smooth curve, not straight lines **oe**

Or

Bottom of the curve should be flat, not pointed **oe**

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Plotting Quadratic Graphs - Mark Scheme

	Question	Answer	
	Exam Questions		

1) (a) Complete the table of values for $y = x^2 - 3$

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

(a) 2 correct values **(1)**

All correct values **(1)**

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

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

(b) At least 5 points plotted correctly **(1)**

Fully correct graph **(1)**

(c) Use your graph to find the minimum value of y.

(c) -3 **(1)**

Plotting Quadratic Graphs - Mark Scheme

| 2) (a) | Complete the table of values for $y = x^2 + 2x - 1$ | (a) | 2 correct values | (1) |
| | | | All correct values | (1) |

x	-3	-2	-1	0	1	2	3
y	2			-1			14

x	-3	-2	-1	0	1	2	3
y	2	-1	-2	-1	2	7	14

| (b) | On the grid, draw the graph of $y = x^2 + 2x - 1$ for the values of x from -2 to 3. | (b) | At least 5 points plotted correctly | (1) |
| | | | Fully correct graph | (1) |

| (c) | Use your graph to identify the roots of the equation $x^2 + 2x - 1 = 0$ | (c) | $-2.4\ (\pm\ 0.1)$ | (1) |
| | | | $0.4\ (\pm\ 0.1)$ | (1) |

3)	On the grid, draw the graph of $y = x^2 - 3x - 1$		At least 2 points found	(1)
			At least 5 points plotted correctly	(1)
			Fully correct graph	(1)