Sketching Graphs - Worksheet

Skill

Group A - Sketching linear and quadratic graphs

Sketch the graphs of the following functions. Indicate where they cross the y-axis:

1) $y = 8x + 3$

2) $y = 4x + 3$

3) $y = 3 - 8x$

4) $y = 3 - 4x$

5) $y = 8x$

6) $y = 4x$

7) $y = x^2 - 7x + 12$

8) $y = x^2 - 8x + 12$

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

10) $y = x^2 - x - 20$

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

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

Group B - Sketching cubic, reciprocal and exponential graphs

Sketch the graphs of the following functions. Indicate where they cross the axes:

1) $y = x^3$

2) $y = x^3 + 4$

3) $y = x^3 - 4$

4) $y = -x^3$

5) $y = -x^3 - 4$

6) $y = 4 - x^3$

7) $y = \frac{2}{x}$

8) $y = \frac{2}{x} + 4$

9) $y = \frac{2}{x} - 4$

10) $y = 3^x$

11) $y = 4^x$

12) $y = 8^x$

Group C - Sketching trigonometric and circle graphs

Sketch the graphs of the following functions. Indicate where they cross the axes:

1) $y = \tan(x)$ for $0 \leq x \leq 360$

2) $y = \sin(x)$ for $0 \leq x \leq 360$

3) $y = \cos(x)$ for $0 \leq x \leq 360$

4) $x^2 + y^2 = 81$

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

6) $x^2 + y^2 = 36$

7) $x^2 + y^2 = 144$

8) $x^2 + y^2 = 16$

9) $x^2 + y^2 = 49$

10) $x^2 + y^2 - 64 = 0$

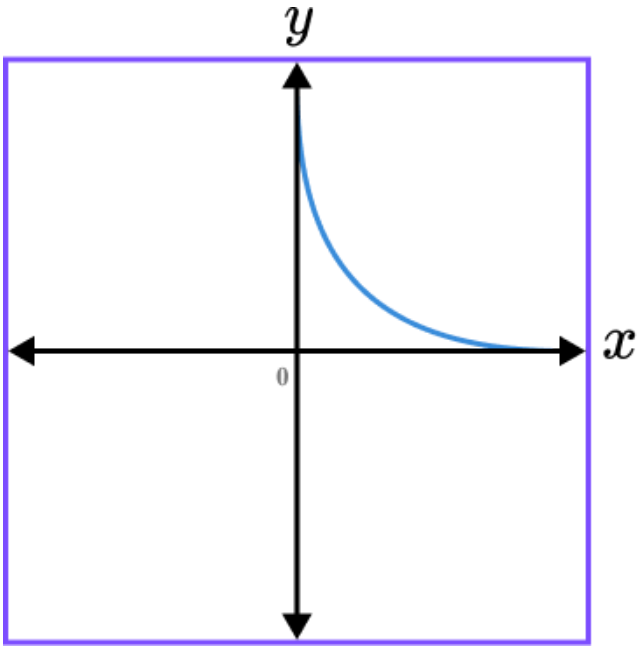
11) $x^2 + y^2 - 121 = 0$

12) $x^2 + y^2 - 4 = 0$

Sketching Graphs - Worksheet

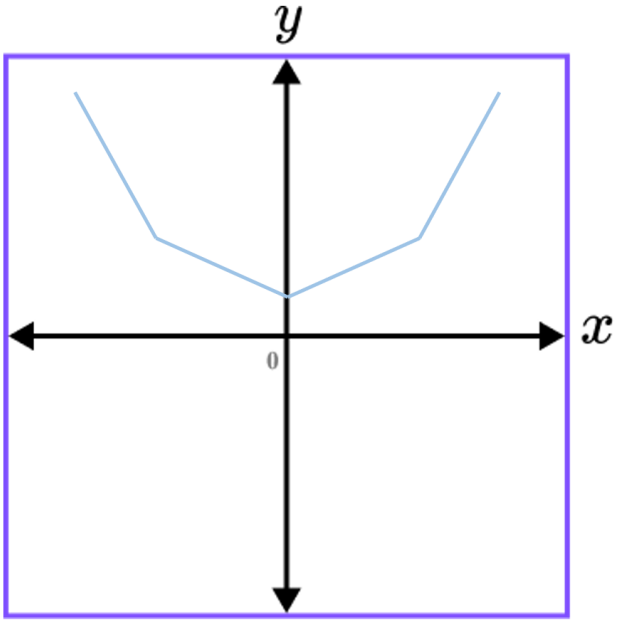
Applied

1) Adam has sketched the graph of $y = \frac{1}{x}$ below.



Make two comments about the accuracy of this sketch.

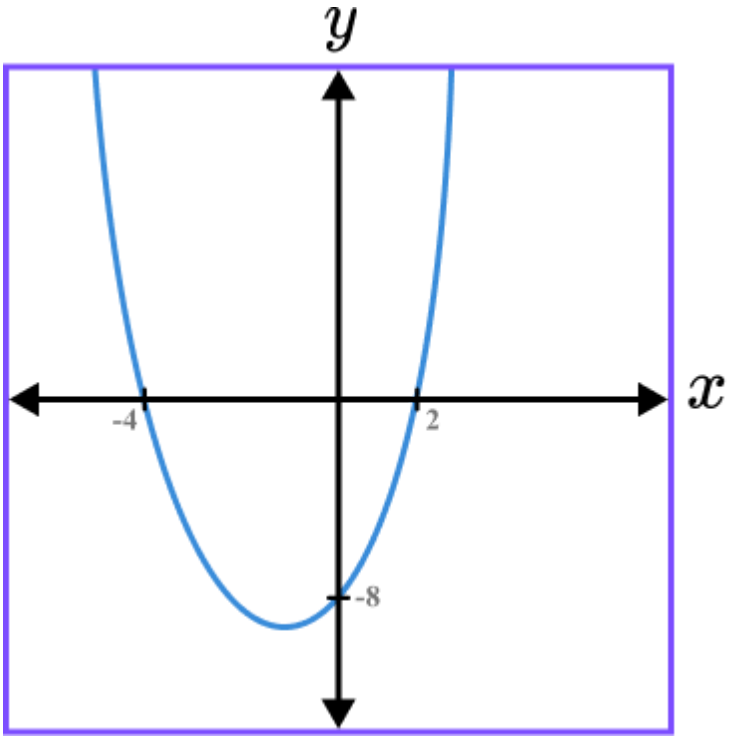
2) Laura has sketched the graph of $y = x^2$ below.



Make two comments about the accuracy of her sketch.

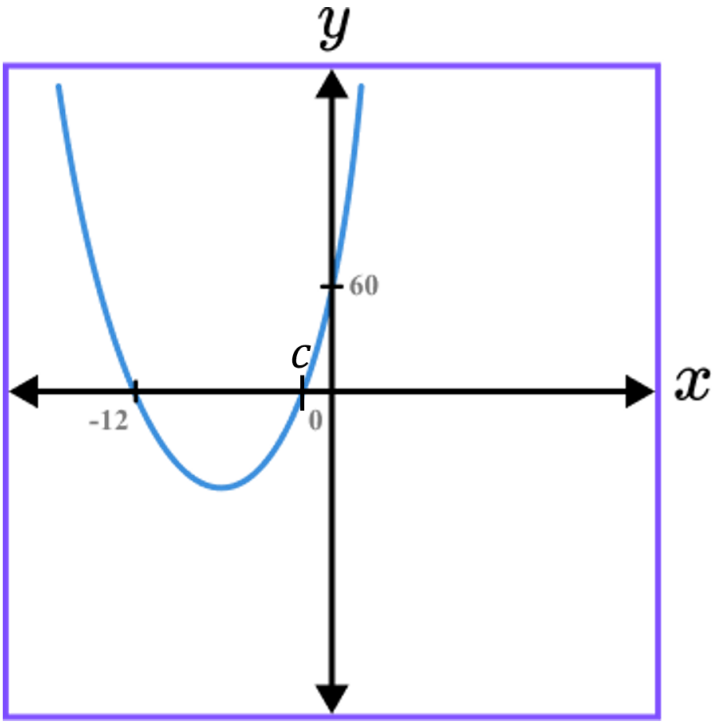
Sketching Graphs - Worksheet

3) Louis sketches the graph of $y = x^2 - 2x - 8$.



Can you spot any mistakes?

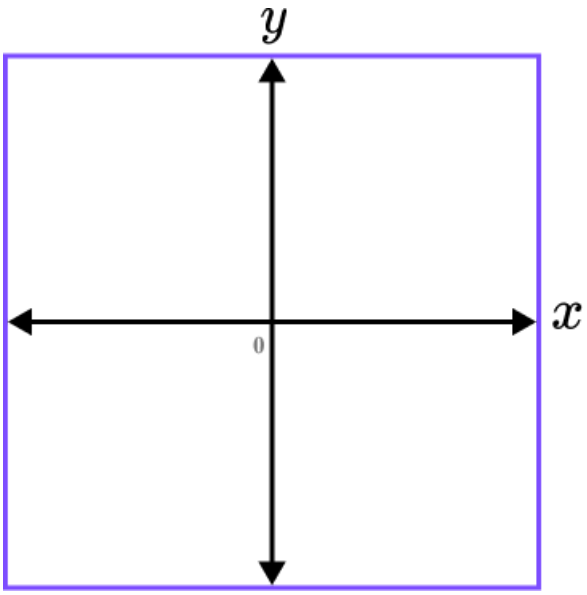
4) Shown is the graph of $y = x^2 + ax + b$.



Find the values of a, b and c.

Sketching Graphs - Exam Questions

1) Sketch the graph of $y = x^2 + 3x - 4$.
Show clearly values of where the graph crosses the axes.



(4 marks)

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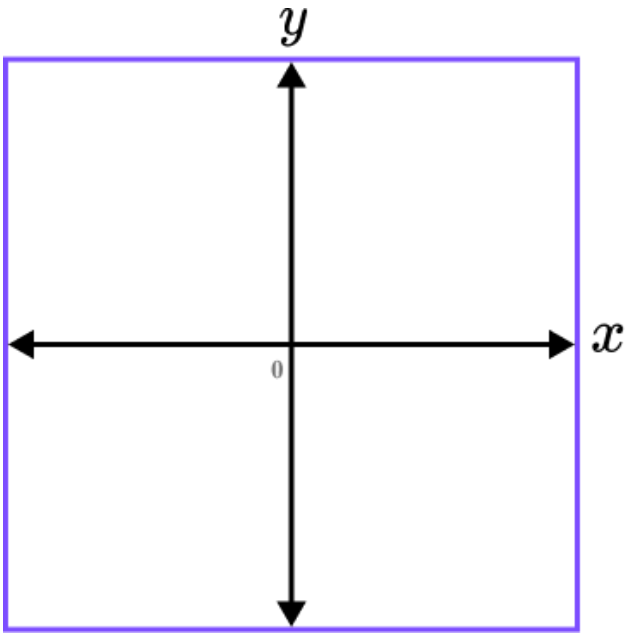
2) (a) Sketch a graph on the axes below that shows the function $y = x^3$

.

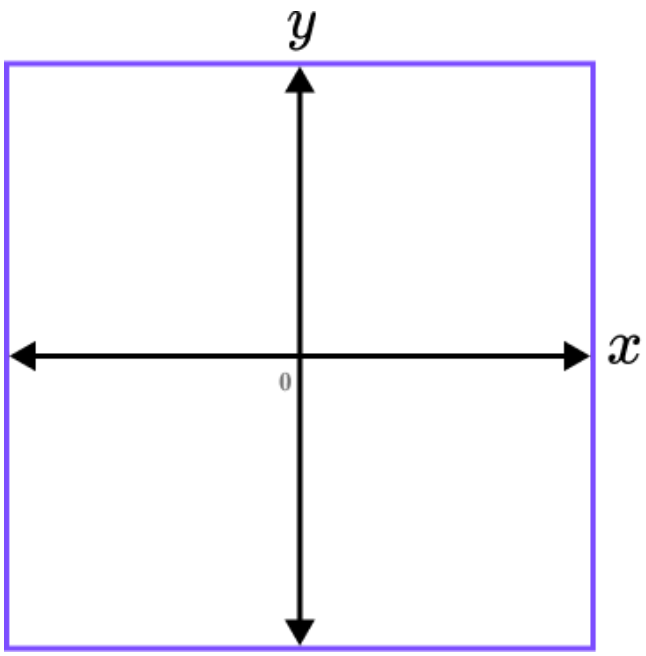


(2)

Sketching Graphs - Exam Questions

(b) Sketch a graph on the axes below that shows the function $y = x^2$

.



(2)

(4 marks)

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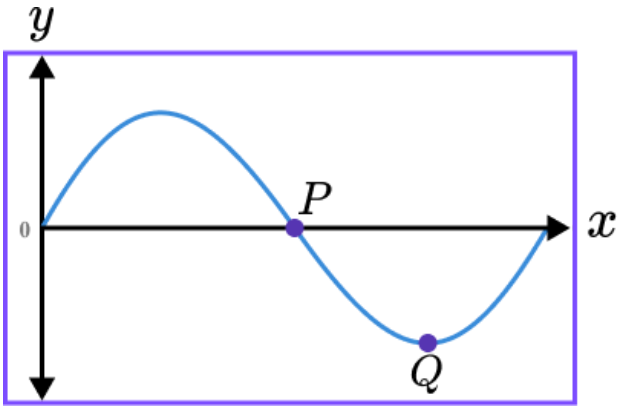
3) The diagram shows part of a sketch of the function $y = \sin(x)$.



(a) Write down the coordinates of the point P.

.....

(1)

(b) Write down the coordinates of the point Q.

.....

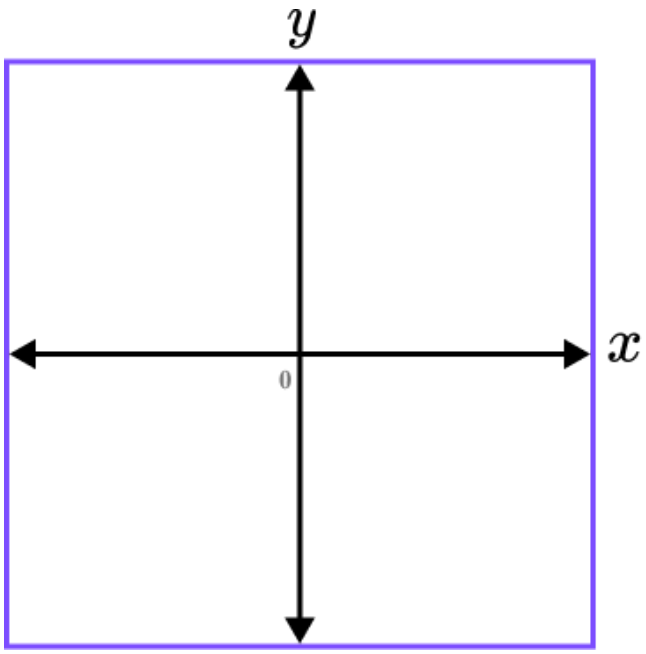
(1)

(2 marks)

Sketching Graphs - Exam Questions

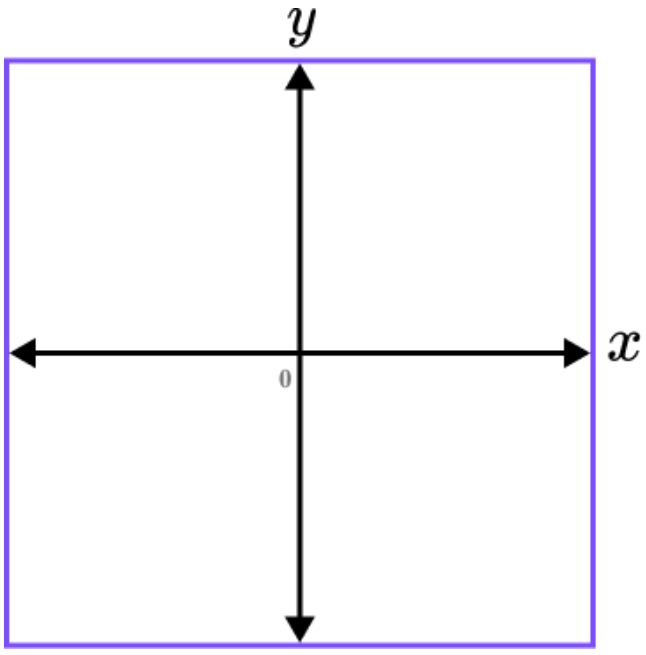
4) **(a)** The equation of Circle C is $x^2 + y^2 = 16$.

Draw a sketch of circle C.



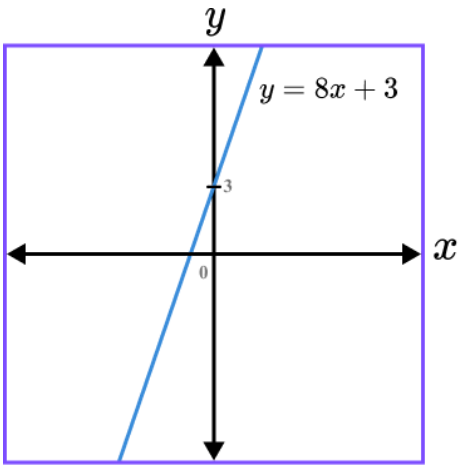
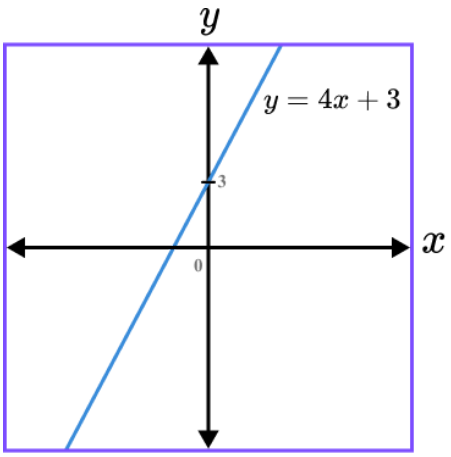
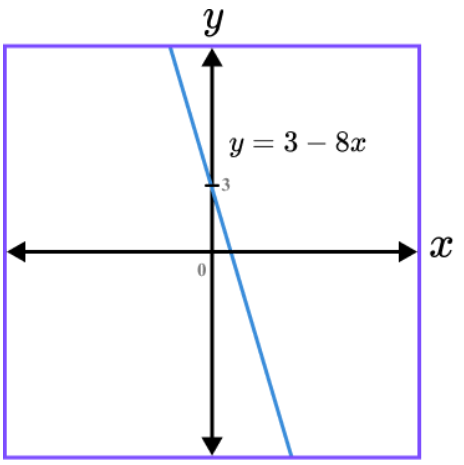
(2)

(b) The circle C is translated by the vector $\begin{pmatrix} 5 \\ 0 \end{pmatrix}$.
Draw a sketch of circle B.

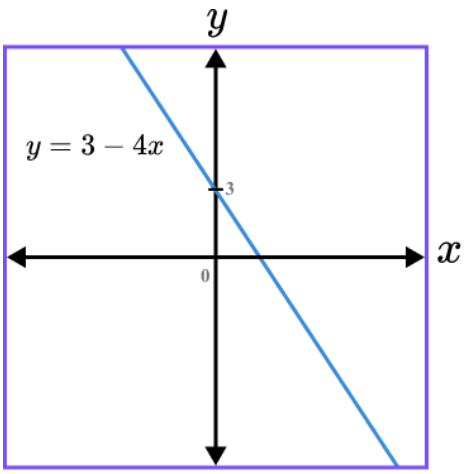
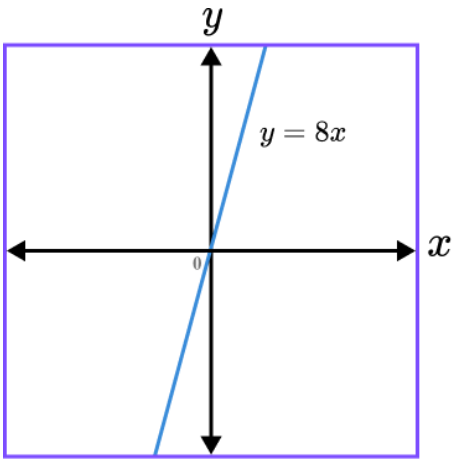
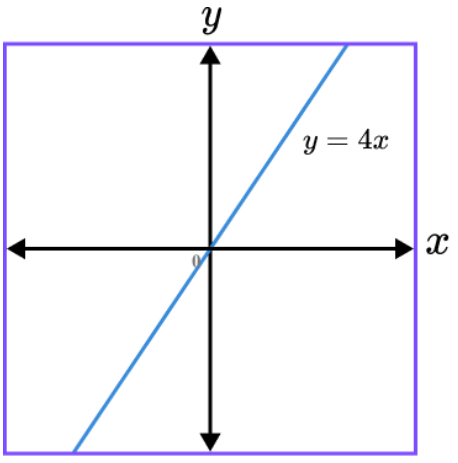


(2)
(4 marks)

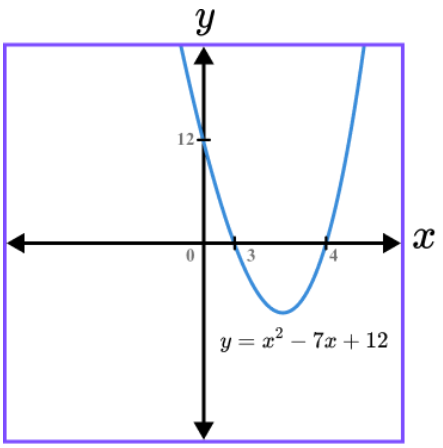
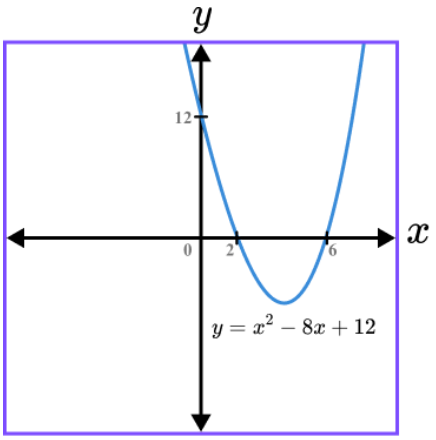
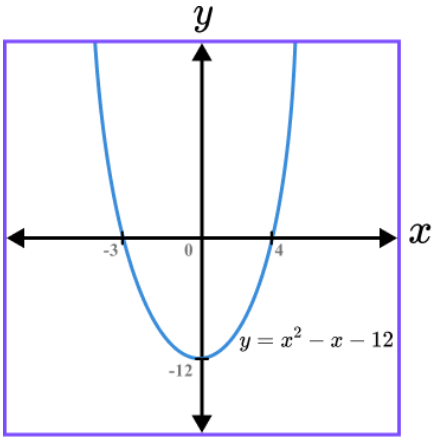
Sketching Graphs - Answers

	Question	Answer
	Skill Questions	
Group A	Sketch the graphs of the following functions. Indicate where they cross the y-axis: **1)** $y = 8x + 3$	**1)** 
	2) $y = 4x + 3$	**2)** 
	3) $y = 3 - 8x$	**3)** 

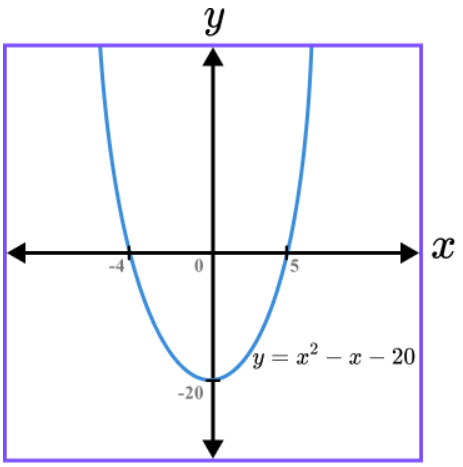
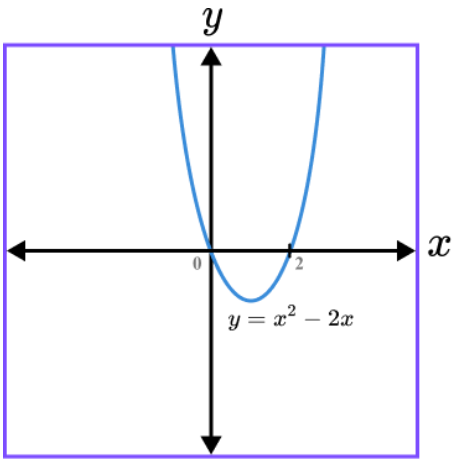
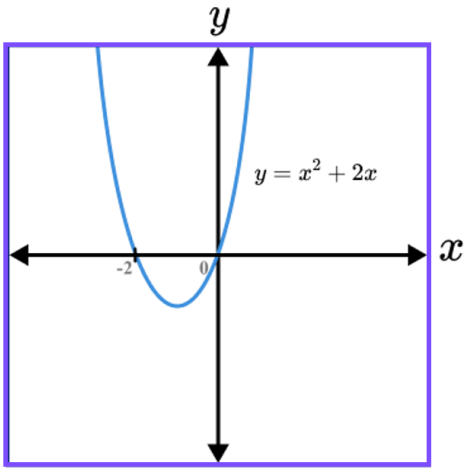
Sketching Graphs - Answers

Group A contd	**4)** $y = 3 - 4x$	**4)** 
	5) $y = 8x$	**5)** 
	6) $y = 4x$	**6)** 

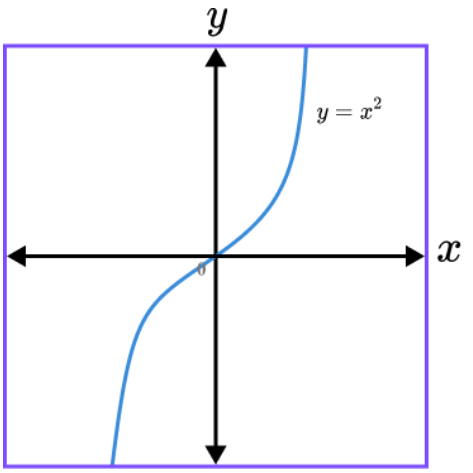
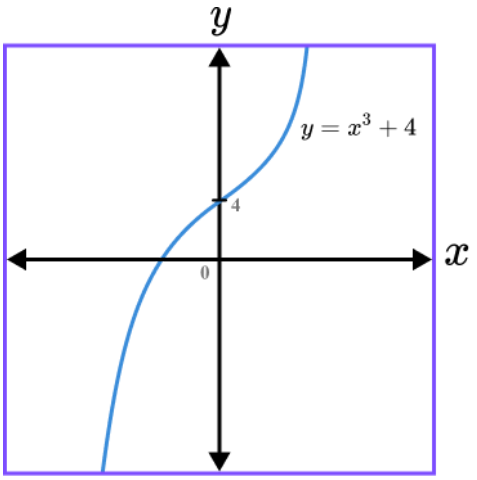
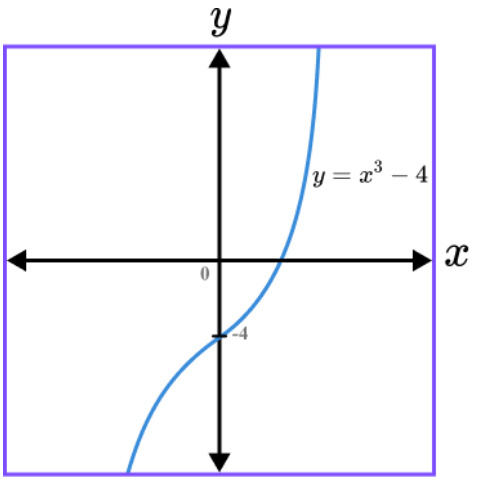
Sketching Graphs - Answers

Group A contd	**7)** $y = x^2 - 7x + 12$	**7)** 
	8) $y = x^2 - 8x + 12$	**8)** 
	9) $y = x^2 - x - 12$	**9)** 

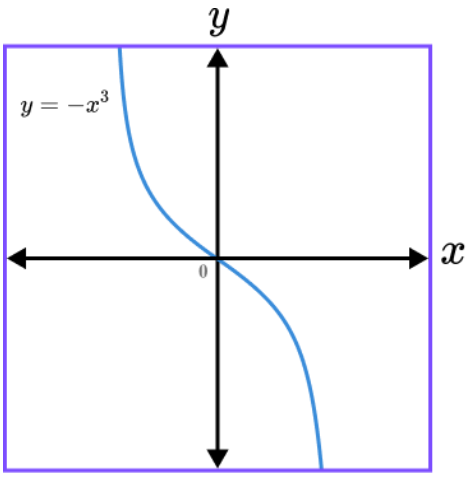
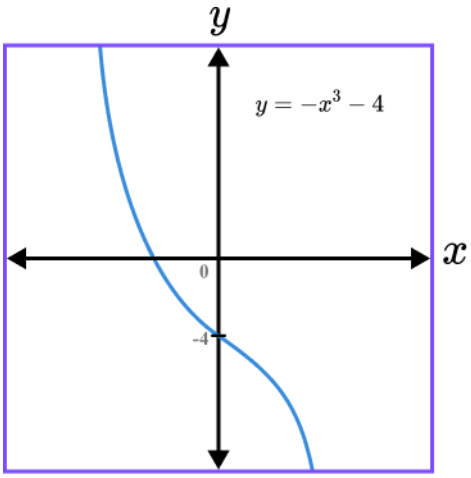
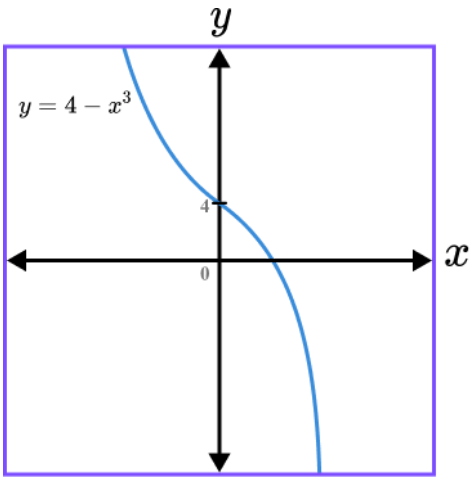
Sketching Graphs - Answers

Group A contd	**10)** $y = x^2 - x - 20$	**10)** 
	11) $y = x^2 - 2x$	**11)** 
	12) $y = x^2 + 2x$	**12)** 

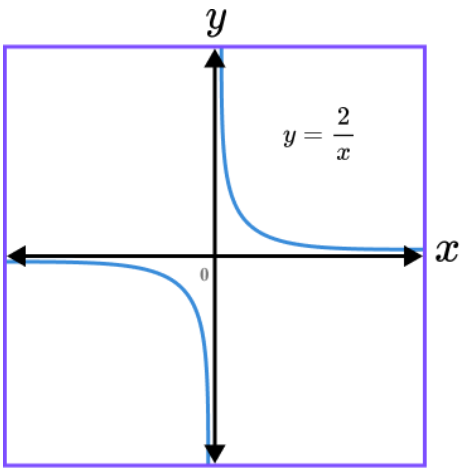
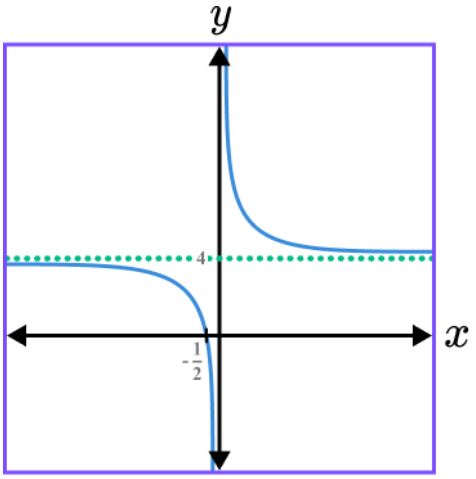
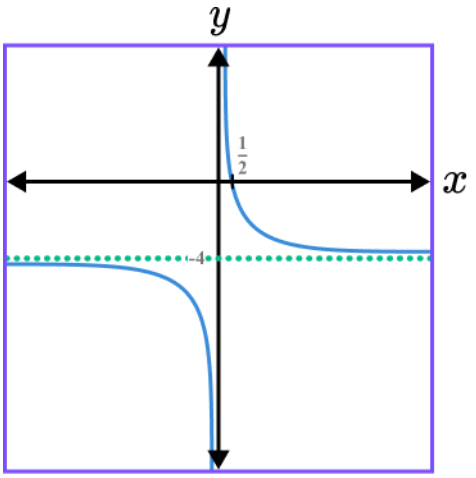
Sketching Graphs - Answers

Group B	Sketch the graphs of the following functions. Indicate where they cross the axes: **1)** $y = x^3$ **2)** $y = x^3 + 4$ **3)** $y = x^3 - 4$	**1)**  **2)**  **3)** 

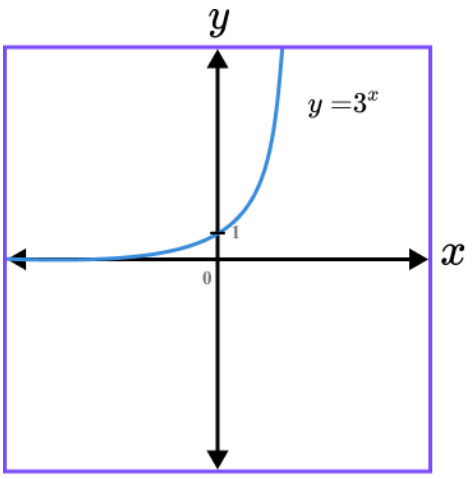
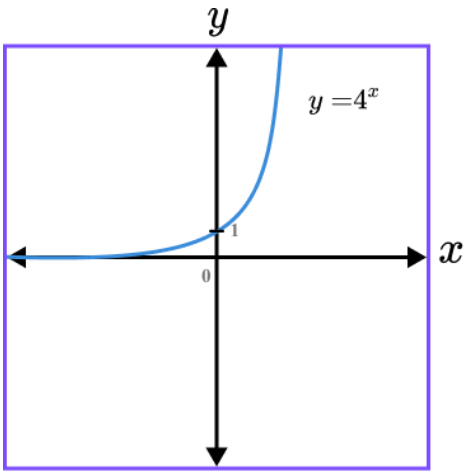
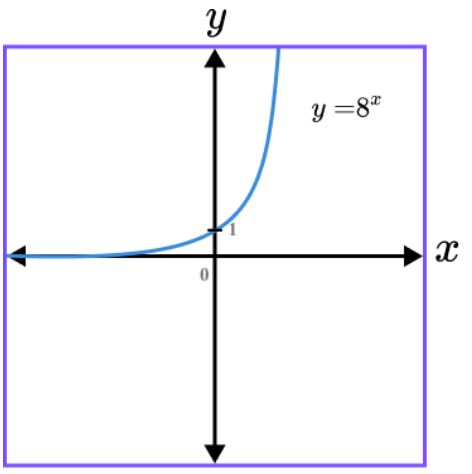
Sketching Graphs - Answers

Group B contd	**4)** $y = -x^3$	**4)** 
	5) $y = -x^3 - 4$	**5)** 
	6) $y = 4 - x^3$	**6)** 

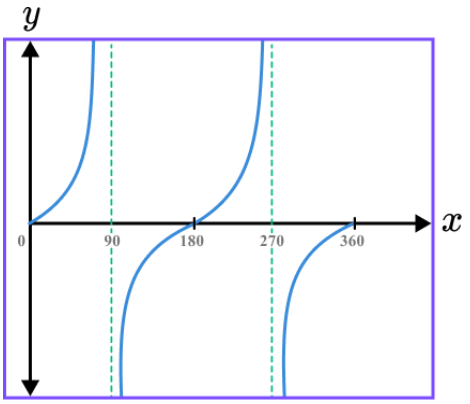
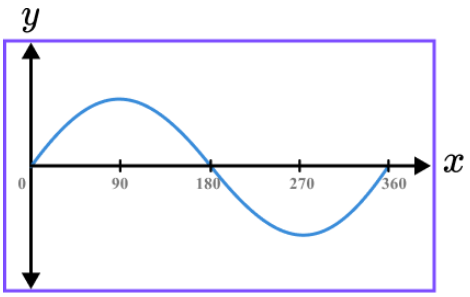
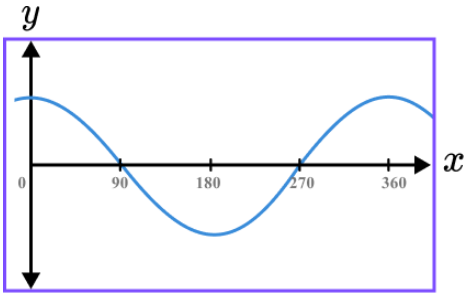
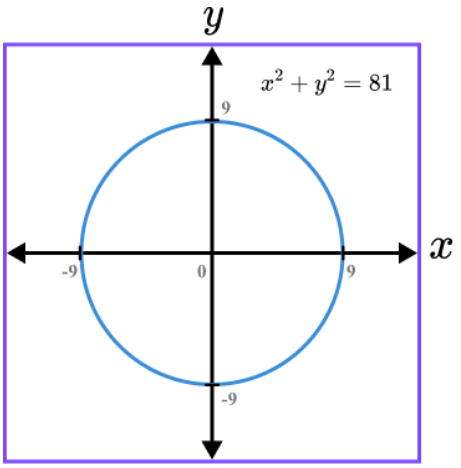
Sketching Graphs - Answers

Group B contd	**7)** $y = \frac{2}{x}$	**7)** 
	8) $y = \frac{2}{x} + 4$	**8)** 
	9) $y = \frac{2}{x} - 4$	**9)** 

Sketching Graphs - Answers

Group B contd	**10)** $y = 3^x$	**10)** 
	11) $y = 4^x$	**11)** 
	12) $y = 8^x$	**12)** 

Sketching Graphs - Answers

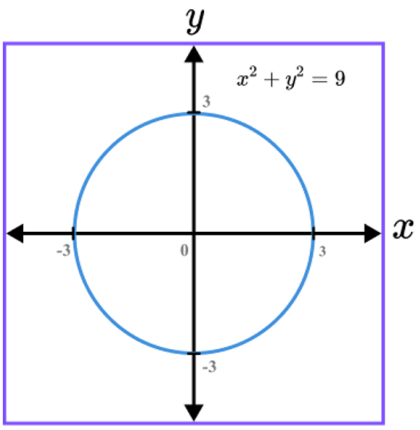
Group C	Sketch the graphs of the following functions. Indicate where they cross the axes: **1)** $y = \tan(x)$, for $0 \leq x \leq 360$	**1)** 
	2) $y = \sin(x)$, for $0 \leq x \leq 360$	**2)** 
	3) $y = \cos(x)$, for $0 \leq x \leq 360$	**3)** 
	4) $x^2 + y^2 = 81$	**4)** 

Sketching Graphs - Answers

Group C contd

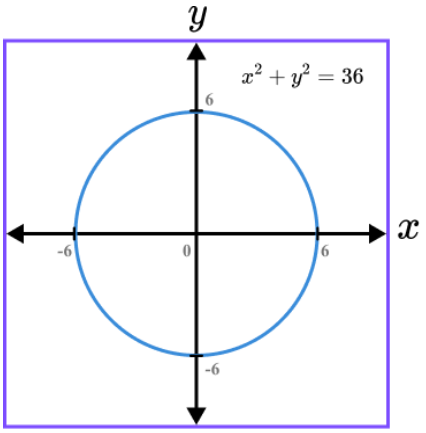
5) $x^2 + y^2 = 9$

5)



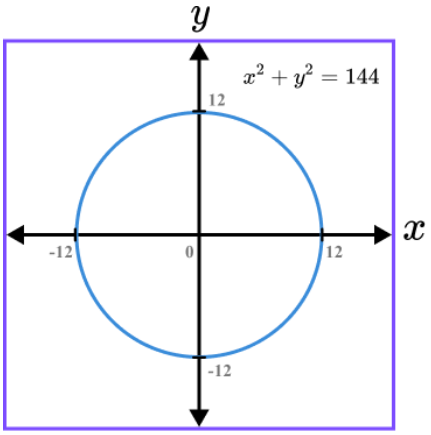
6) $x^2 + y^2 = 36$

6)



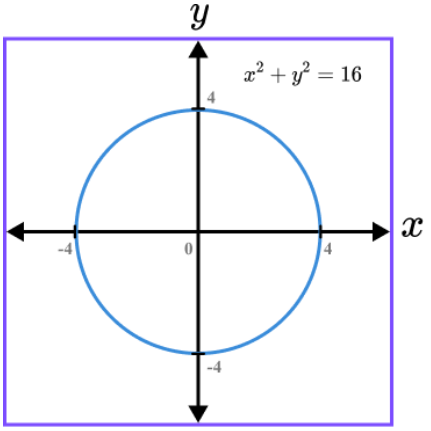
7) $x^2 + y^2 = 144$

7)

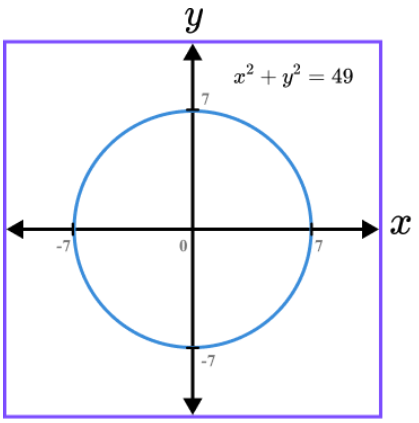
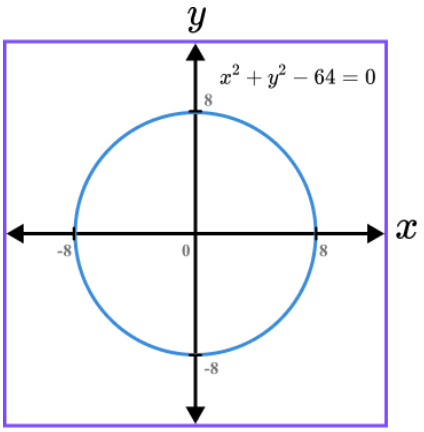
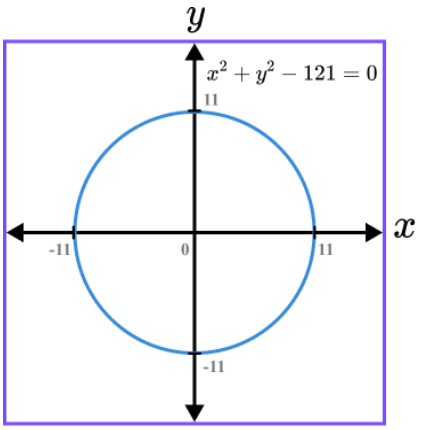
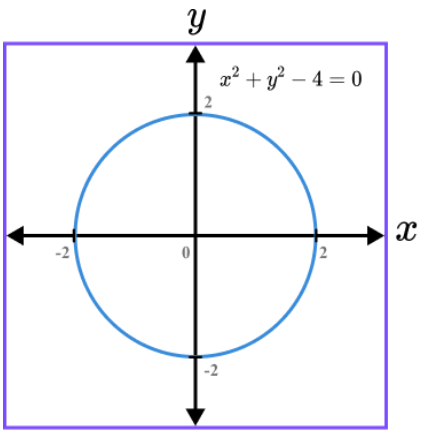


8) $x^2 + y^2 = 16$

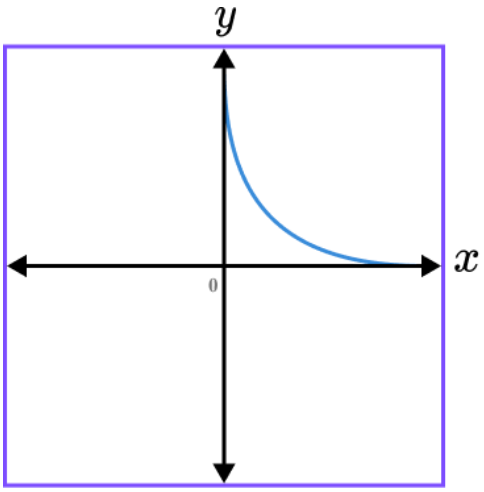
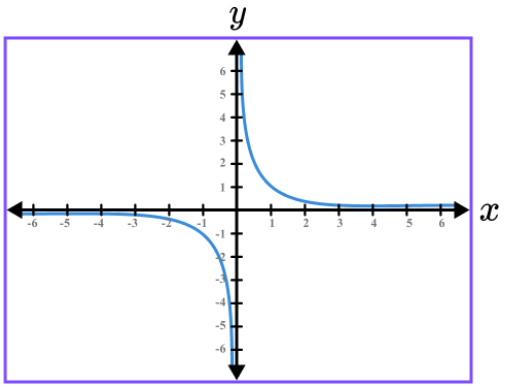
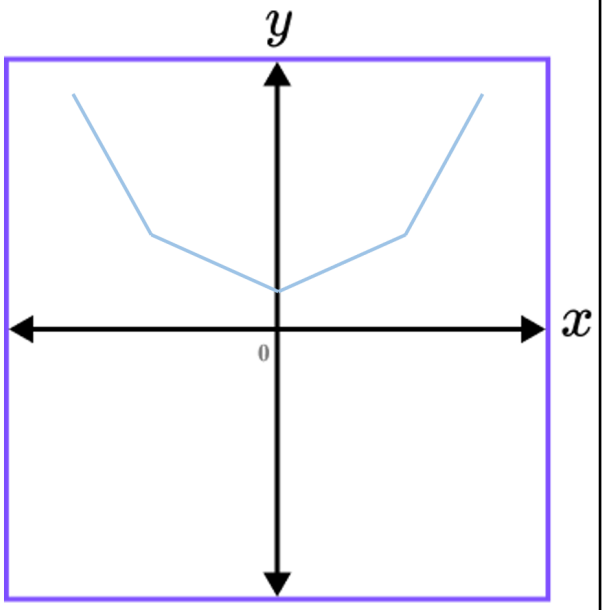
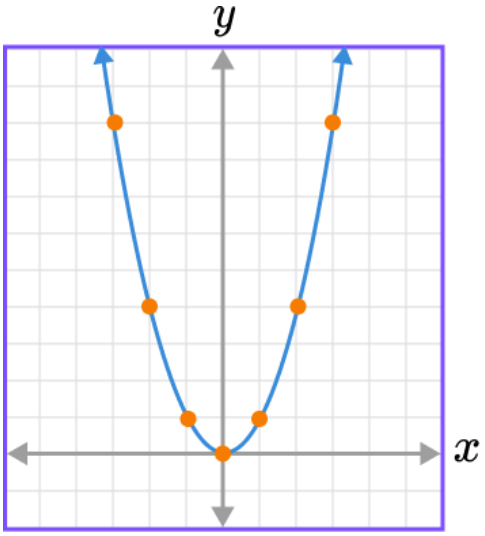
8)



Sketching Graphs - Answers

Group C contd	**9)** $x^2 + y^2 = 49$	**9)** 
	10) $x^2 + y^2 - 64 = 0$	**10)** 
	11) $x^2 + y^2 - 121 = 0$	**11)** 
	12) $x^2 + y^2 - 4 = 0$	**12)** 

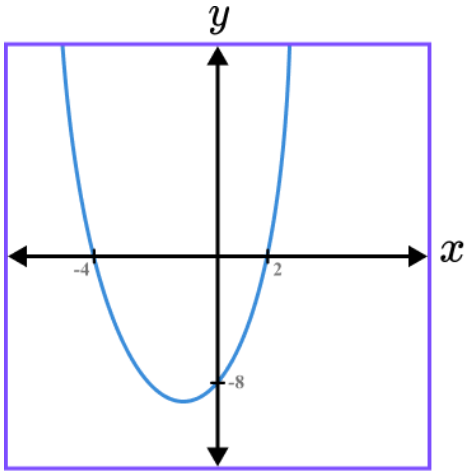
Sketching Graphs - Answers

	Question	Answer
	Applied Questions	
1)	Adam has sketched the graph of $y = \frac{1}{x}$ below.  Make two comments about the accuracy of this sketch.	The graph should not touch the axes. The graph should have a mirror image in quadrant 3. 
2)	Laura has sketched the graph of $y = x^2$ below.  Make two comments about the accuracy of her sketch.	The graph should be a smooth curve, not straight lines joining the points. The graph should have a minimum point at $(0, 0)$. 

Sketching Graphs - Answers

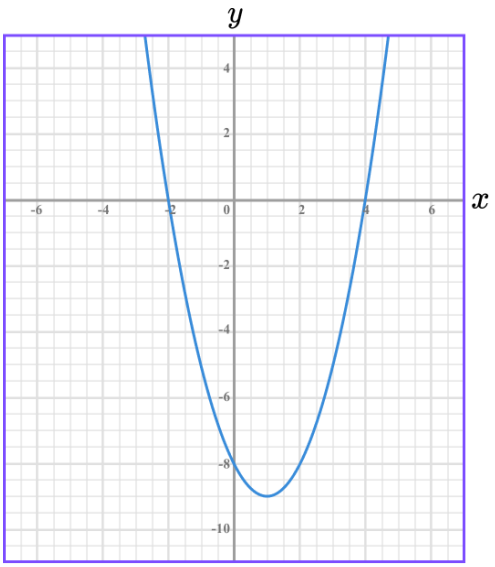
3)

Louis sketches the graph of $y = x^2 - 2x - 8$.



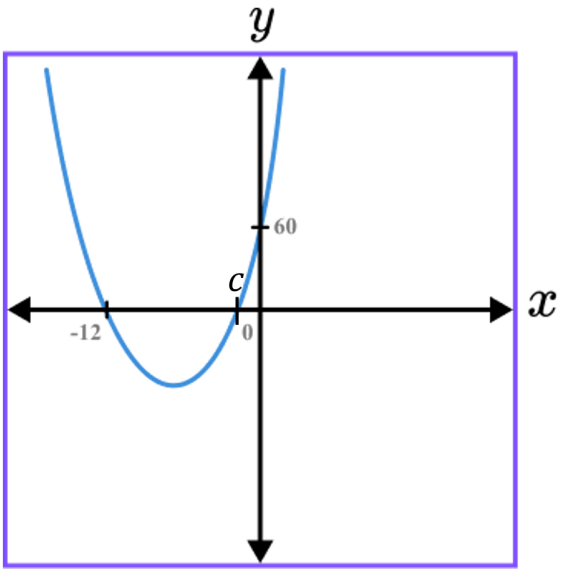
Can you spot any mistakes?

The graph is reflected in the y axis.



4)

Shown is the graph of $y = x^2 + ax + b$.



Find the values of a, b and c.

$y = (x + 12)(x + 5)$

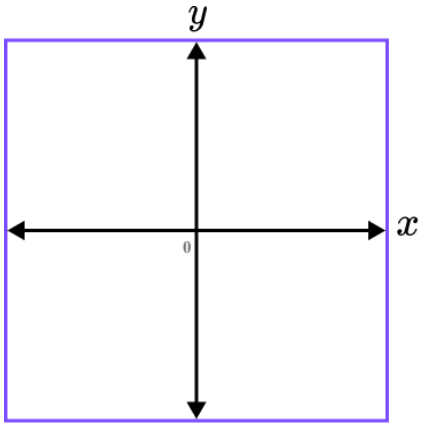
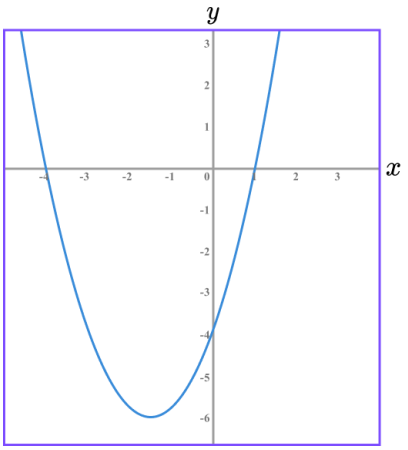
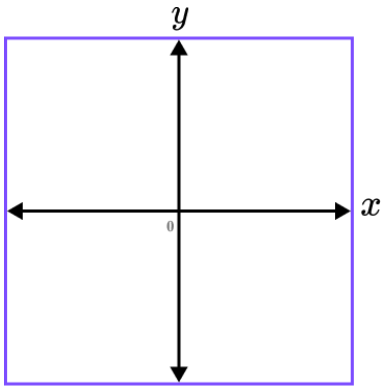
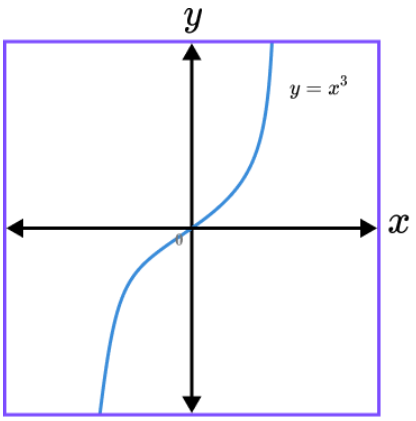
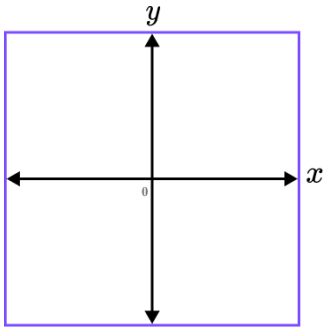
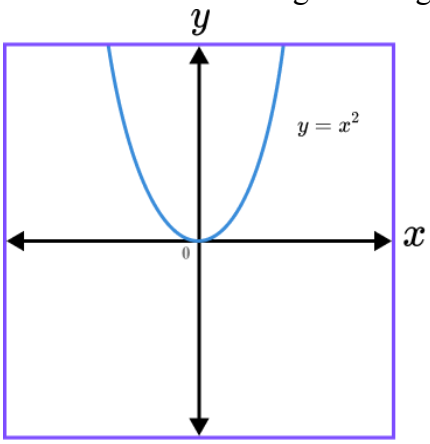
$y = x^2 + 17x + 60$

$a = 17$

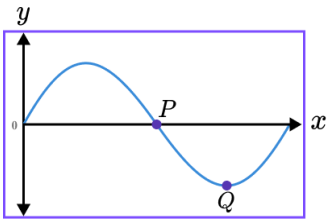
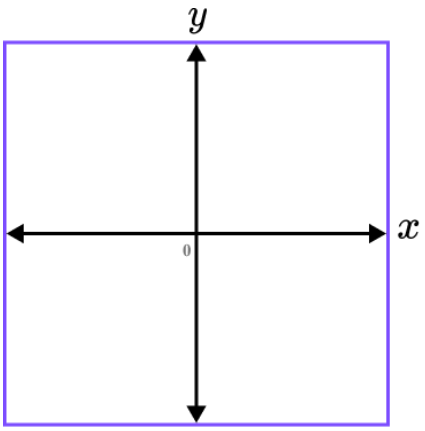
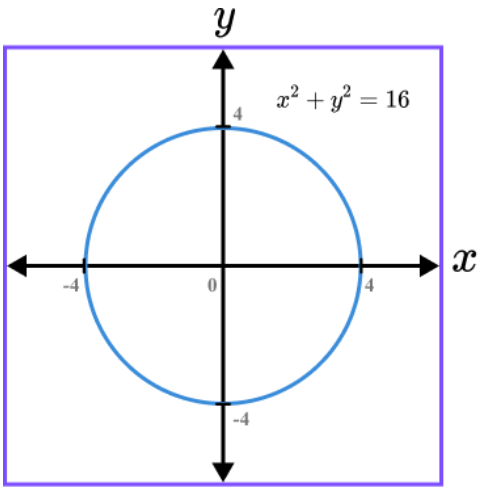
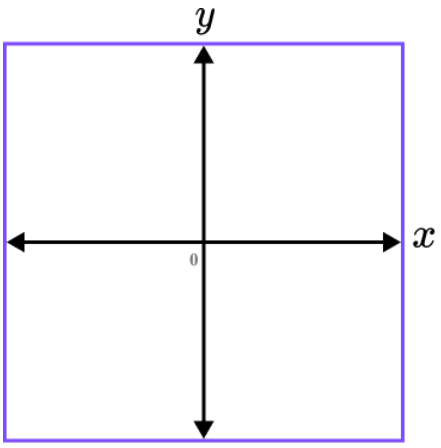
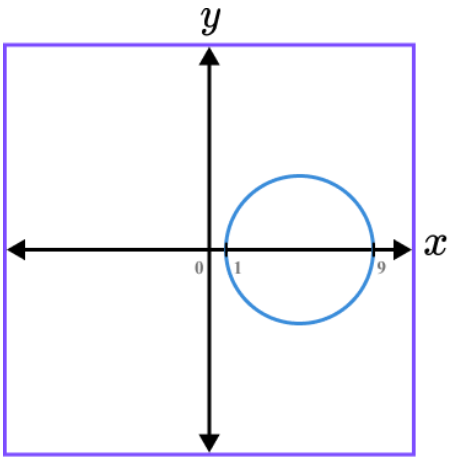
$b = 60$

$c = -5$

Sketching Graphs - Mark Scheme

	Question	Answer	
	Exam Questions		
1)	Sketch the graph of $y = x^2 + 3x - 4$. Show clearly values of where the graph crosses the axes. 	 Parabola shape y-intercept of -4 $y = (x + 4)(x - 1)$ x-intercepts of -4 and 1	**(1)** **(1)** **(1)** **(1)**
2) **(a)**	Sketch a graph on the axes below that shows the function $y = x^3$. 	**(a)**  Correct shape A curve that cuts through the origin	**(1)** **(1)**
(b)	Sketch a graph on the axes below that shows the function $y = x^2$. 	**(b)** Correct shape A curve that cuts through the origin 	**(1)** **(1)**

Sketching Graphs - Mark Scheme

3)	The diagram shows part of a sketch of the function $y = \sin(x)$. 		
(a)	Write down the coordinates of the point P.	**(a)** $(180\ ,\ 0)$	**(1)**
(b)	Write down the coordinates of the point Q.	**(b)** $(270\ ,\ -1)$	**(1)**
4) **(a)**	The equation of Circle C is $x^2 + y^2 = 16$. Draw a sketch of circle C. 	**(a)** Any circle centre $(0, 0)$ drawn Correct radius 	**(1)** **(1)**
(b)	The circle C is translated by the vector $\begin{pmatrix}5\\0\end{pmatrix}$. Draw a sketch of circle B. 	**(b)** Any circle drawn Correct intercepts on x-axis 	**(1)** **(1)**