

Number plane graphs

UNIT 4: The circle

QUESTION 1 Write the coordinates of the centre and the length of the radius for each of the following circles.

a $x^2 + y^2 = 4$ _____

b $x^2 + y^2 = 49$ _____

c $x^2 + y^2 = \frac{4}{9}$ _____

d $x^2 + y^2 = 81$ _____

QUESTION 2 Write the equation of each of the following circles, whose centre and radius are given.

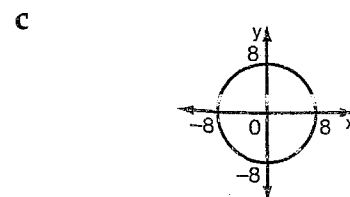
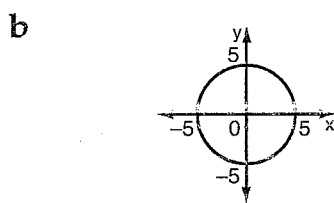
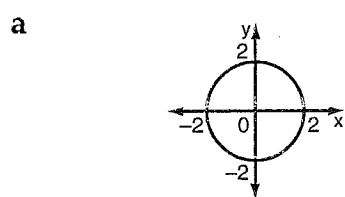
a Centre (0, 0), radius = 3 units

b Centre (0, 0), radius = 7 units

c Centre (0, 0), radius = 2 units

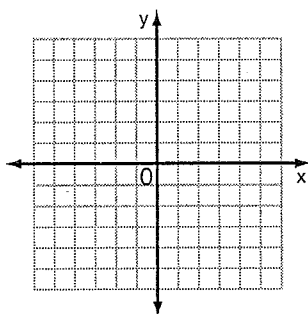
d Centre (0, 0), radius = 10 units

QUESTION 3 Write the equation of each of the following circles.

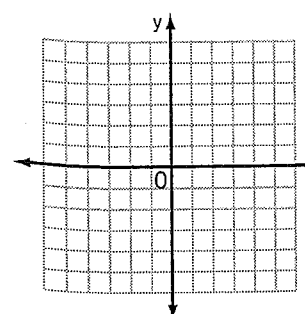


QUESTION 4 Graph each of the following circles, stating the radius and the centre.

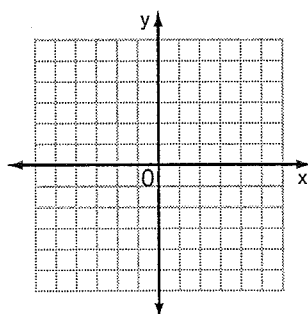
a $x^2 + y^2 = 16$



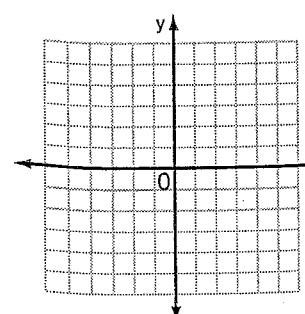
b $x^2 + y^2 = 1$



c $x^2 + y^2 = 9$



d $x^2 + y^2 = 36$



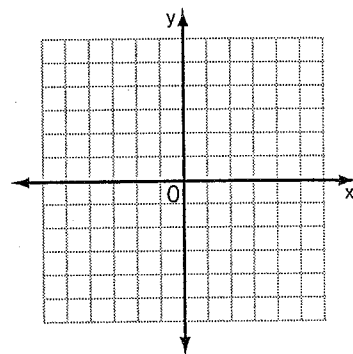
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UNIT 5: The hyperbola

QUESTION 1 Complete the table of values and then draw the graphs of the following hyperbolas.

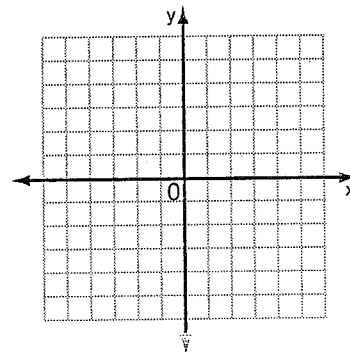
a $y = \frac{1}{x}$

x	-4	-2	-1	-0.5	0	0.5	1	2	4
$y = \frac{1}{x}$									



b $y = \frac{4}{x}$

x	-4	-2	-1	-0.5	0	0.5	1	2	4
$y = \frac{4}{x}$									



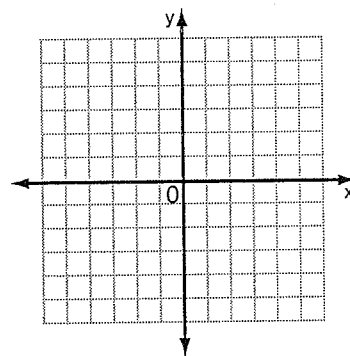
QUESTION 2 On the same set of axes, draw the graphs of the following hyperbolas.

a $y = \frac{2}{x}$

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

c $xy = 6$

d $xy = -6$

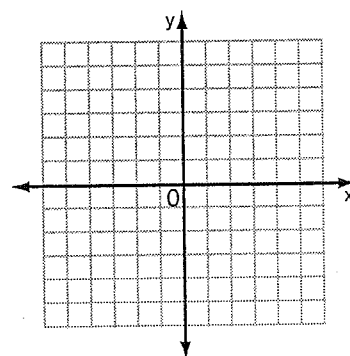


QUESTION 3 On the same set of axes, draw the graphs of the following hyperbolas.

a $y = \frac{-1}{x}$

b $y = \frac{3}{x}$

c $y = \frac{-4}{x}$

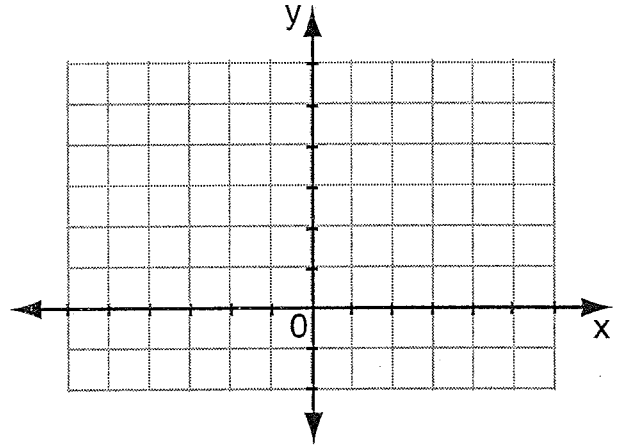


UNIT 6: Exponential graphs

QUESTION 1 Draw the graphs of the following exponential functions on the same set of axes.

a $y = 2^x$

b $y = 2^{-x}$

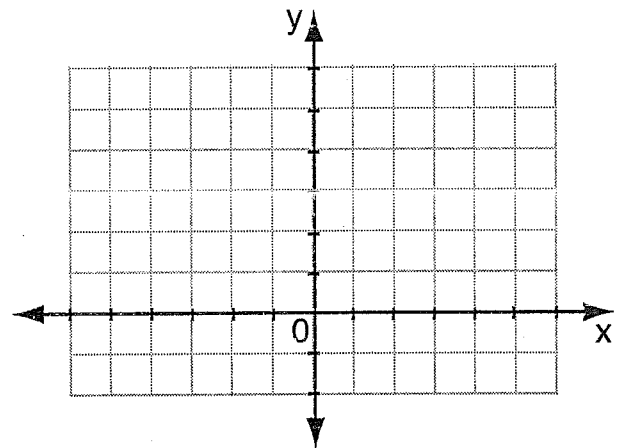


QUESTION 2 Draw the graphs of the following exponential functions on the same set of axes.

a $y = 2^x$

b $y = 3^x$

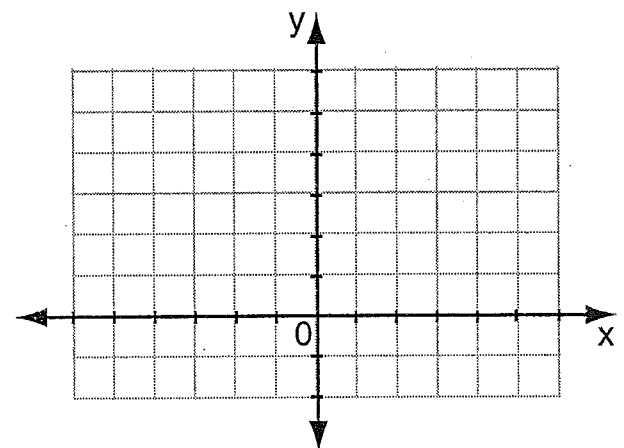
c $y = 5^x$



QUESTION 3 Complete the table of values and then draw the graph of the following exponential function.

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

x	-1	0	1	2	3
$y = 3^x$					
$y = 3^{-x}$					
$y = \frac{3^x + 3^{-x}}{2}$					



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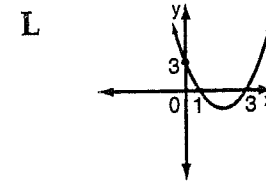
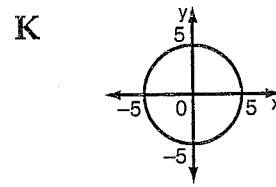
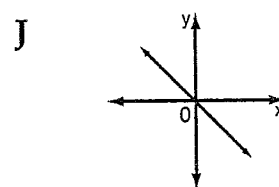
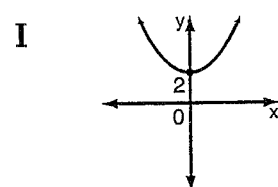
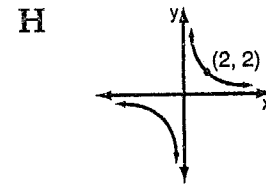
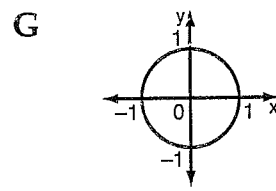
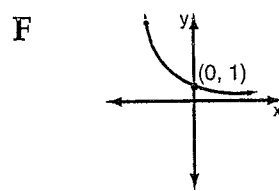
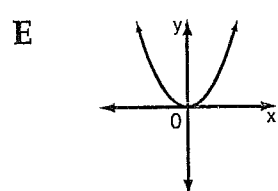
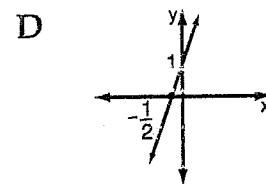
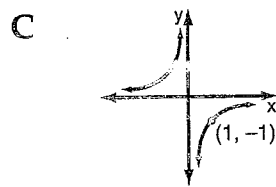
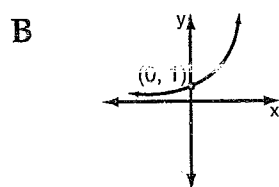
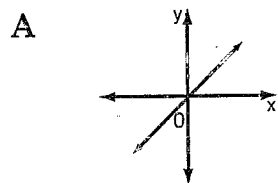
UNIT 7: Miscellaneous graphs

QUESTION 1 For the following equations, write whether the graphs are straight lines, parabolas, hyperbolas, circles, exponential functions, or none of these.

- | | | | | | |
|---|--------------------------|---|-------------------------|---|------------------------|
| a | $y = x$ _____ | b | $xy = 6$ _____ | c | $y = 0$ _____ |
| d | $y = x^2 - 5x + 6$ _____ | e | $y = x^2$ _____ | f | $y = 3^{-x}$ _____ |
| g | $y = x^2 - 1$ _____ | h | $y = \frac{2}{x}$ _____ | i | $y = x^3$ _____ |
| j | $x^2 + y^2 = 16$ _____ | k | $y = 2^x$ _____ | l | $x^2 + y^2 = 64$ _____ |

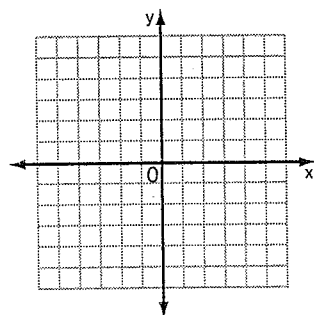
QUESTION 2 Match the equations with the graphs sketched below.

- | | | | | | | | |
|---|---------------------|---|--------------------------|---|--------------------|---|------------------------|
| a | $y = 2x + 1$ _____ | b | $y = \frac{2}{x}$ _____ | c | $y = 2^{-x}$ _____ | d | $x^2 + y^2 = 1$ _____ |
| e | $y = x^2 + 2$ _____ | f | $xy = -1$ _____ | g | $y = x$ _____ | h | $y = 2^x$ _____ |
| i | $y = x^2$ _____ | j | $y = x^2 - 4x + 3$ _____ | k | $y = -x$ _____ | l | $x^2 + y^2 = 25$ _____ |

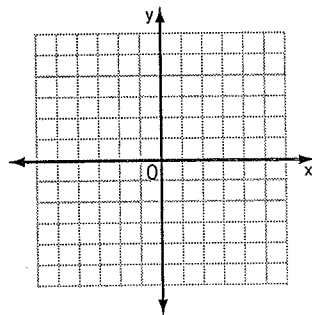


QUESTION 3 Draw a separate sketch for each of the following.

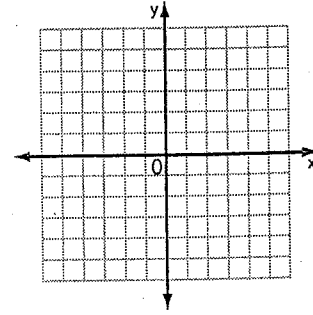
a $y = 2x + 3$



b $y = 2x^2$



c $x^2 + y^2 = 9$



Number plane graphs

UNIT 2: Quadratic graphs

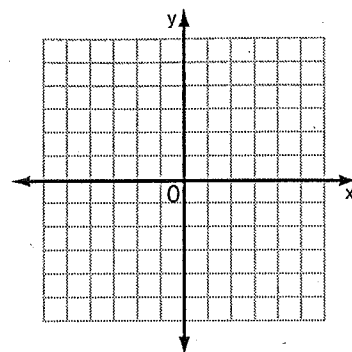
QUESTION 1 Complete the table of values and then, on the same number plane, draw the graphs of the following.

a $y = x^2$

x	-3	-2	-1	0	1	2	3
$y = x^2$							
$y = 2x^2$							
$y = \frac{1}{2}x^2$							

b $y = 2x^2$

c $y = \frac{1}{2}x^2$



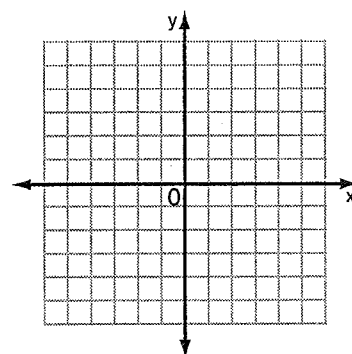
QUESTION 2 Complete the table of values and then, on the same number plane, draw the graphs of the following.

a $y = x^2$

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

b $y = x^2 + 2$

c $y = x^2 - 2$



QUESTION 3 Complete the table of values for $y = x^2 - 1$ and sketch its graph.

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

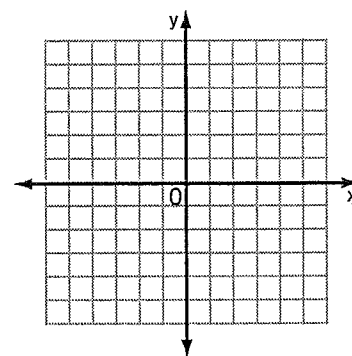
a What is the equation of its axis of symmetry?

b What are the coordinates of its vertex?

c What is the minimum value for $y = x^2 - 1$?

d Find the x -intercepts.

e Find the y -intercept.



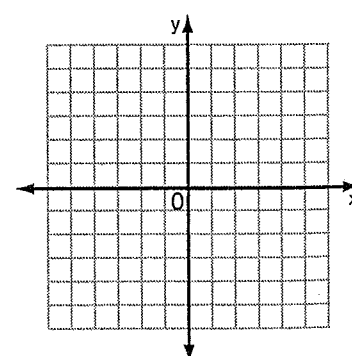
QUESTION 4 Sketch the graphs of the following.

a $y = x^2$

b $y = x^2 + 3$

c $y = x^2 - 3$

Explain how the graphs of $y = x^2 + 3$ and $y = x^2 - 3$ can be drawn using $y = x^2$.



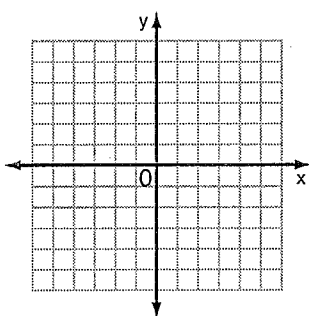
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UNIT 3: Parabolas in the form $y = ax^2 + bx + c$

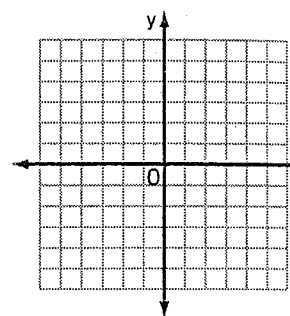
QUESTION 1 For the following parabolas:

- i find the y -intercept
- ii find the x -intercepts
- iii find the axis of symmetry
- iv find the vertex
- v sketch the graph.

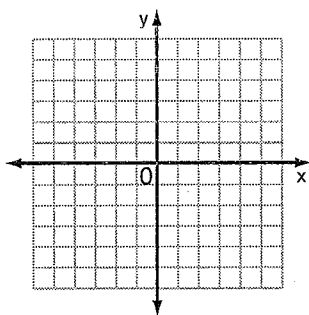
a $y = x^2 - 6x + 8$



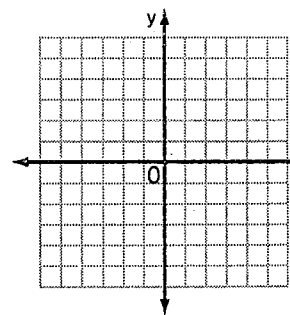
b $y = x^2 - 6x + 5$



c $y = x^2 - 2x - 3$

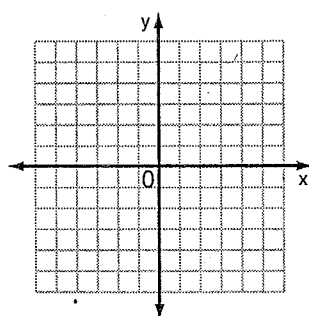


d $y = x^2 - 2x - 8$

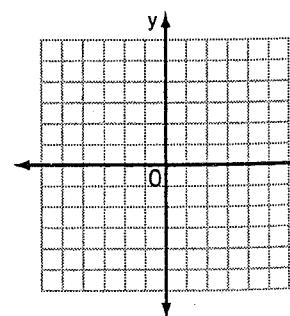


QUESTION 2 Sketch the following parabolas, showing all the important features.

a $y = x^2 - 4x + 3$



b $y = x^2 - 5x + 6$



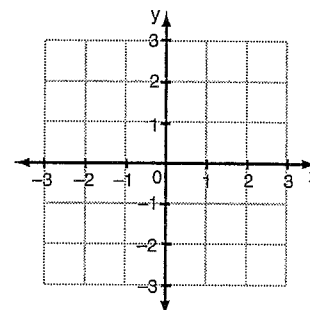
CHAPTER 3

Number plane graphs

UNIT 1: Line graphs

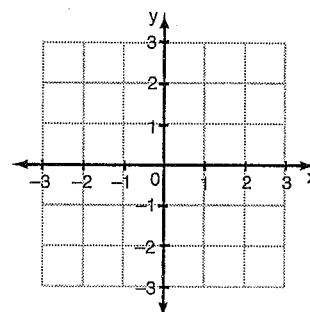
QUESTION 1 On the same number plane, draw the graphs of the following.

- a $y = x$
- b $y = -x$
- c $y = 2x$
- d $y = \frac{1}{2}x$



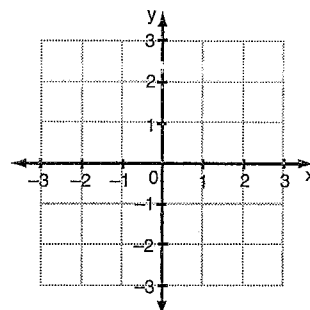
QUESTION 2 On the same number plane, draw the graphs of the following.

- a $y = x$
- b $y = x + 2$
- c $y = x - 2$



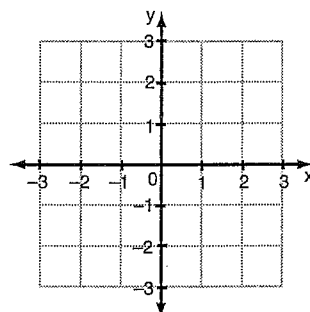
QUESTION 3 On the same number plane, draw the graphs of the following.

- a $y = 2x + 1$
- b $x + 2y = 6$
- c $2x - 3y = 0$



QUESTION 4 On the same number plane, draw the graphs of the following by first finding the x -intercept and the y -intercept.

- a $x + y - 3 = 0$
- b $2x - y = 6$



QUESTION 5 On the same number plane, sketch the graphs of the following.

- a $x = 0$
- b $y = 0$
- c $x = 3$
- d $y = -2$

