Student Activity 2b



Tables for each of the functions below are drawn on the next page of this document for $x \in \{-3, -2, -1, 0, 1, 2, 3\}$.

Fill out the tables for each function first so that you can decide on a scale which will suit all the functions when plotting a graph.

Plot all the graphs **using the same axes and scales** using the grid given on the next page. Verify the shape of each graph by calculating y values of points, between those plotted, and comparing the answers with the y values of the same points given by your graph.

Polynomial in the form $f(x) = a(x+h)^2 + k$	State the shape of the graph and whether it opens upwards or downwards	x – intercepts (algebraic method and using the graph)	y – intercept (algebraic method and using the graph)	Maximum/ minimum point as an ordered pair and labelled as max or min	Real root(s) of f(x) =0	Equation of the axis of symmetry	f (2.7)	Solve f(x) = 8	For what x values is $f(x)$ positive i.e. $f(x) > 0$?	For what x values is $f(x)$ negative i.e. $f(x) < 0$?	For what x values is f(x) increasing?	For what x values is f(x) decreasing?
$f(x) = x^2$												
$y = (x+2)^2$												
$y = (x+2)^2 - 3$												
$y = 2(x+2)^2$												
$y = 2(x+2)^2 - 3$												

1. How does the graph of $y = (x+2)^2 + 3$ compare to the graph of $y = x^2$? What transformation of the plane will transform $y = x^2$ onto $y = (x+2)^2 + 3$?

2. How does the graph of $y = 2(x+2)^2 - 3$ compare to $y = x^2$?

3. Compare and contrast the graphs of $y = (x+2)^2 - 3$ and $y = 2(x+2)^2 - 3$.

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Draw the graph of $y = x^2$ using a black marker and use different coloured markers to draw the other curves. Label all the graphs clearly.

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х	$f(x) = x^2$	(x, y)
**	2	
X	$y = (x+2)^2$	(x, y)
Х	$y = (x+2)^2 - 3$	(x, y)
	y (x+2) 3	(, , , ,
X	$y = 2(x+2)^2 - 3$	(x, y)

Student Activity 2b



On the axes below g is the graph of the function $g(x)=x^2$

Write the equations for the graphs the functions p,q,r, and s in the form $y=(x+h)^2+k$

