Student Activity 2b

Project Maths Tionscadal Mata Development Team

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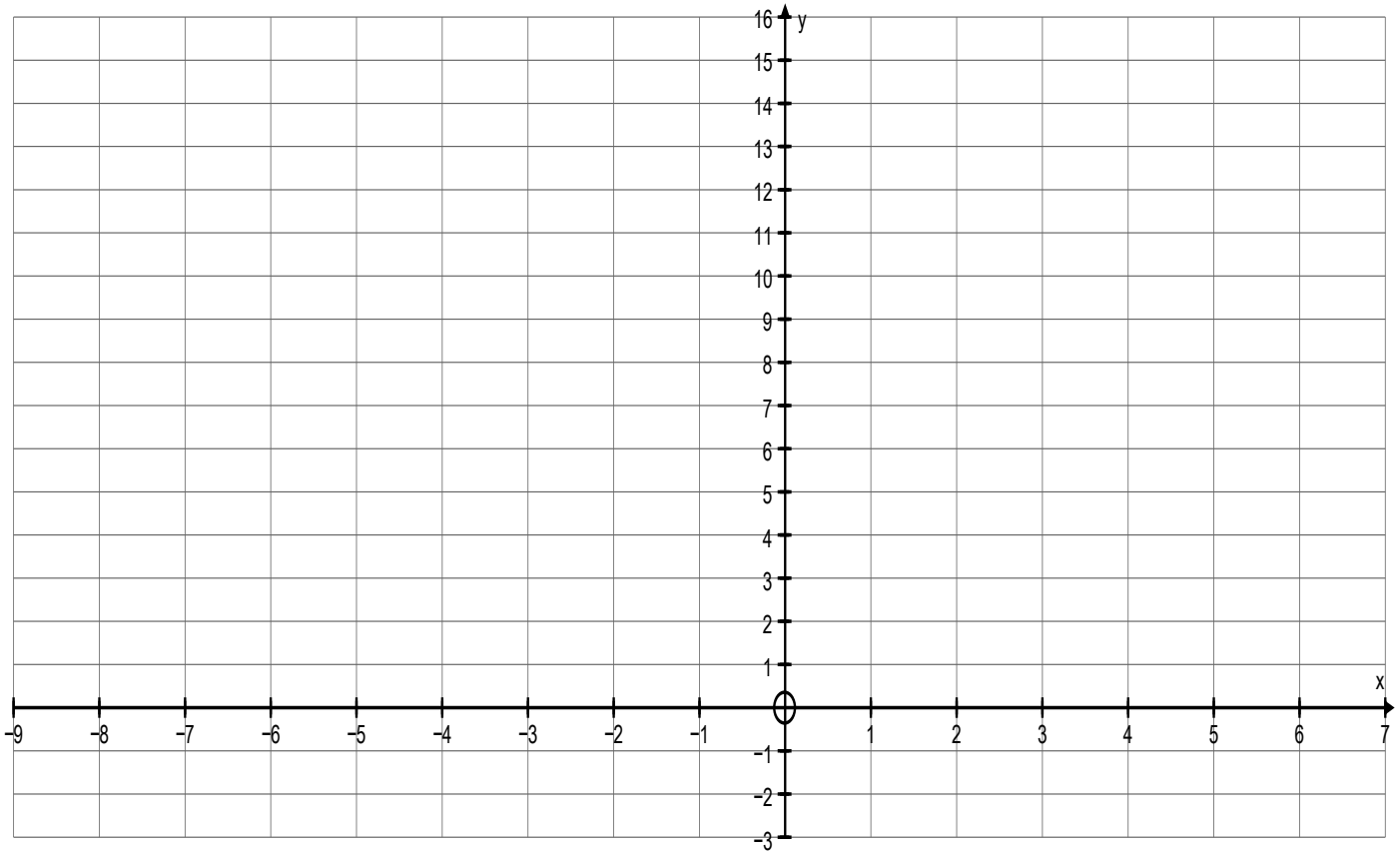
Draw the graph of $y = x^2$ using a black marker and use different coloured markers to draw the other curves.

Label all the graphs clearly.



x	$f(x) = x^2$	(x, y)

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

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

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

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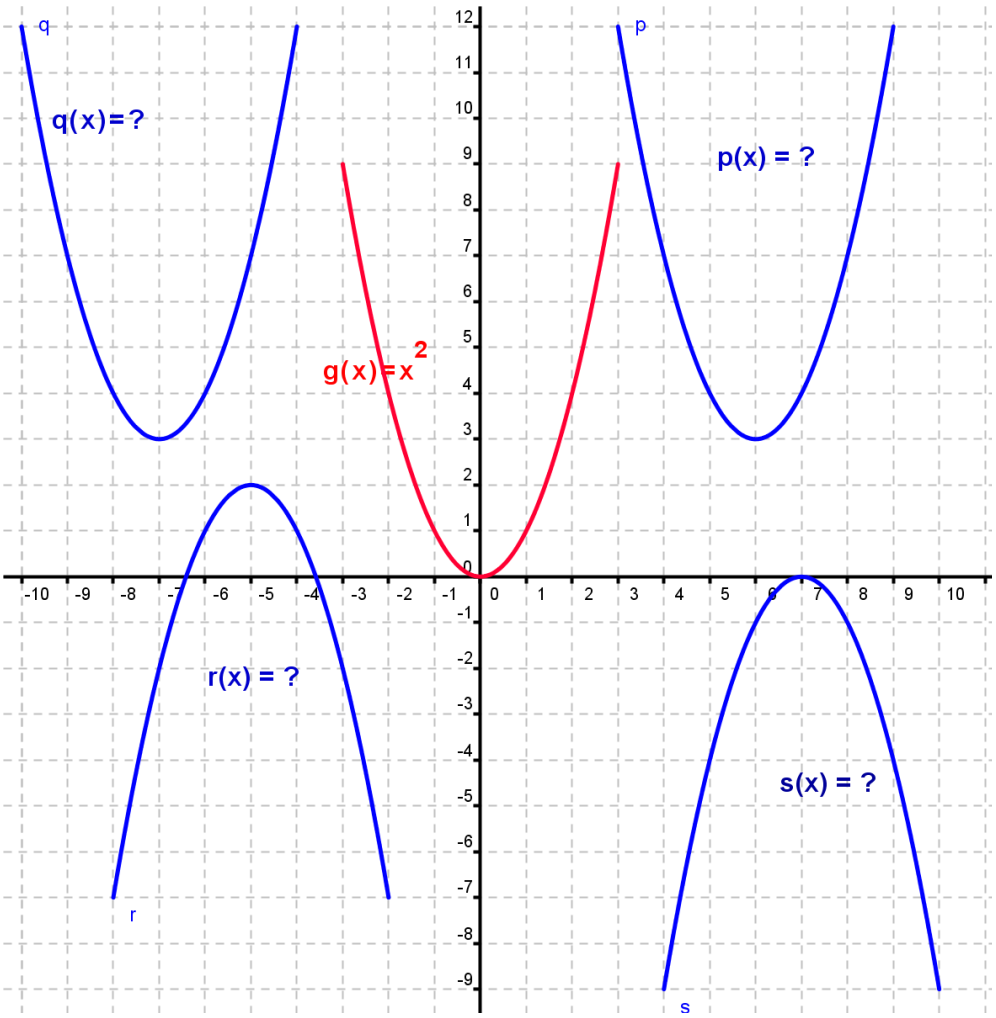
On the axes below g is the graph of the function $g(x) = x^2$

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



$p(x) =$
$s(x) =$
$r(x) =$
$q(x) =$