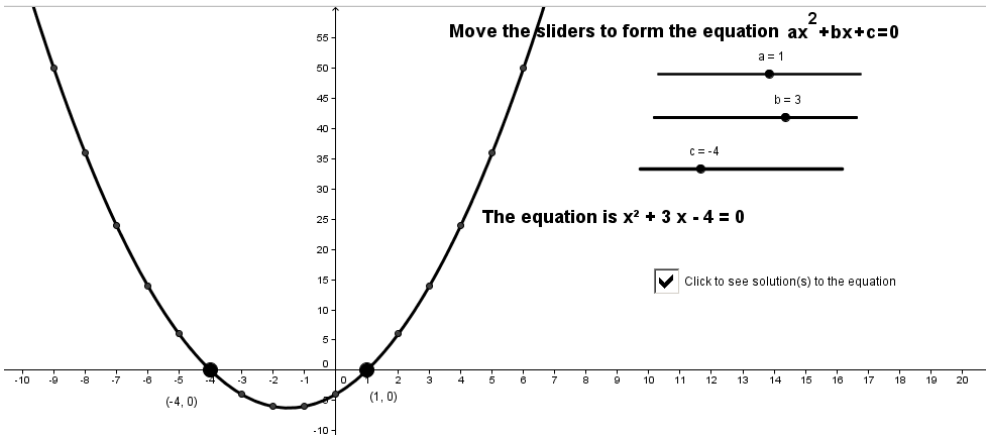
<u>Student Activity:</u> To investigate quadratics of the form

$f(x) = ax^2+bx+c$

Use in connection with the interactive file, 'Quadratic', on the student's CD.

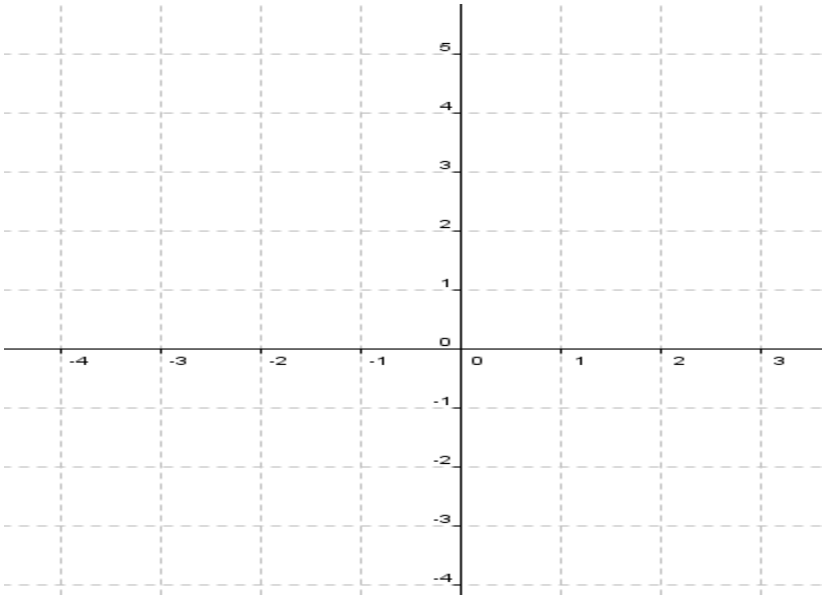


1)

a) Complete the following table:

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

b) Draw the graph represented in the above table.



c) Where does the graph intersect the x axis?

_____

d) What is the value of f(x) at the points where the graph intersects the x axis?

_____

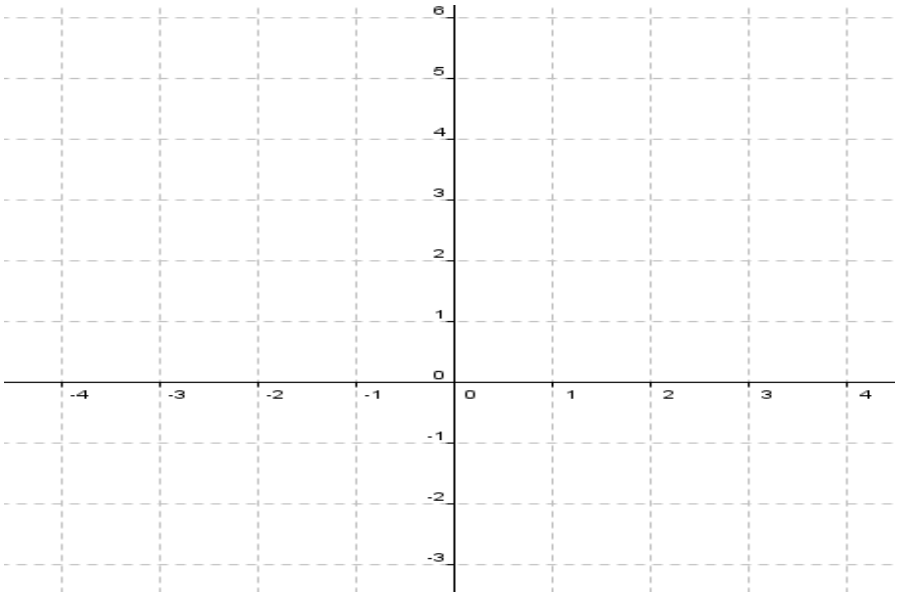
e) Given that the solution(s) of an equation are the points where the graph of the equation cuts the x axis, what is the solution of $x^2+2x-3=0$?

_____

2) Complete the following table:

x	x^2	x	-2	$y = x^2+x-2$
-3				
-2				
-1				
-0.5				
0				
1				
2				

a) Draw the graph represented in the above table.



b) Where does the graph intersect the x axis?

_____

c) What is the value of f(x) at the points where the graph cuts the x axis?

_____

_____

d) What is the solution(s) of $x^2+2x-2=0$.

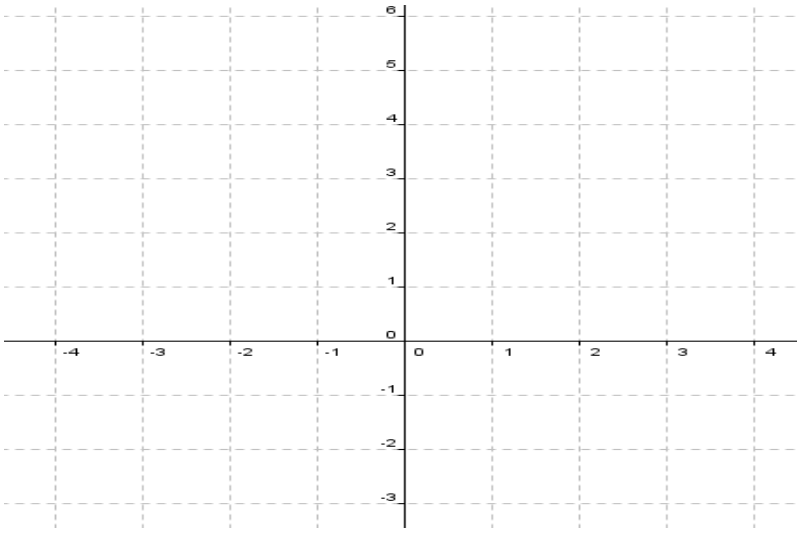
_____

3)

a) Complete the following table:

x	x^2	x	1	$y = x^2+2x+1$
−3				
−2				
−1				
−0.5				
0				
1				
2				

b) Draw the graph represented in the above table.



c) Where does the graph intersect the x axis?

_____

d) What is the value of f(x) at the points where the graph cuts the x axis?

_____

e) What is the solution of $x^2+2x+1=0$.

_____

4) Using the interactive file determine what happens to the shape of the graph when a=0.

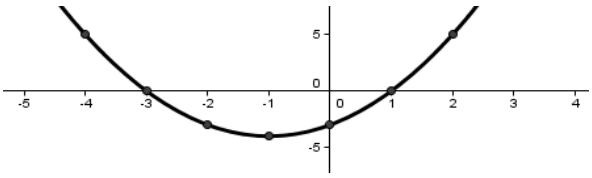
_____

5) Using the interactive file determine what happens to the shape of the graph when a equals minus one.

_____

6)

a) Where does the following graph cut the x axis?

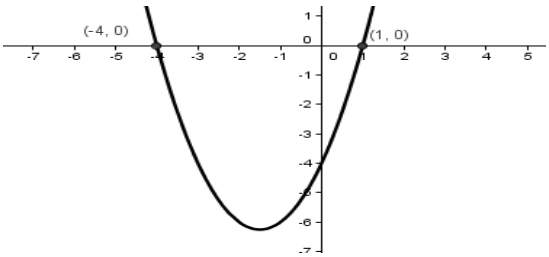


b) Write the equation in the form $(x-m)(x-n)=0$, where m and n are the x co-ordinates of the points where the graph cuts the x axis. Write the equation in the form $ax^2+bx+c=0$. Check the shape of this graph using the interactive file.

_____

7)

a) Where does the following graph cut the x axis?



b) Write the equation in the form $(x-p)(x-q)=0$, where p and q are the x co-ordinates the points where the graph cuts the x axis. Write the equation in the form $ax^2+bx+c=0$. Check the shape of this graph using the interactive file.

_____

8) Using the interactive file, what happens to the graph as a increases in value where a is greater than zero?

_____

9) Using the interactive file, what happens to the graph as a decreases in value where a is greater than zero?

_____

10) Using the interactive file, what happens to the graph when a is less than zero?

_____

11) Using the interactive file, what happens to the graph as c increases in value?

_____

12) Using the interactive file, what happens to the graph as c decreases in value?

_____

13) Will the equation of this graph have the format $ax^2+bx+c=0$ or $-ax^2+bx+c=0$ where a is greater than zero?