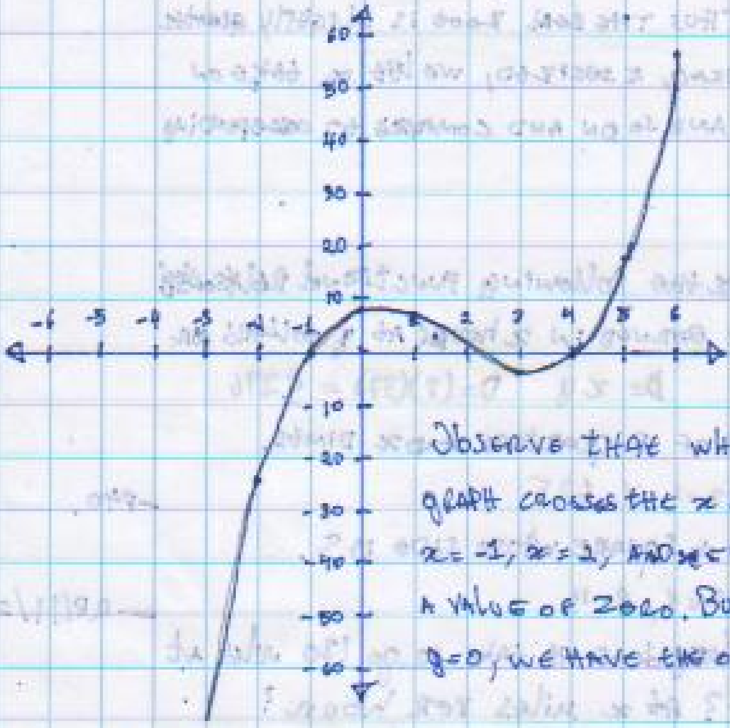
Now by factoring the quotient we find that $x^2-6x+8=(x-4)(x-2)$. Therefore $x^3-5x^2+2x+8=(x+1)(x-4)(x-2)=0$. If each factor is set to equal zero, we find that $x=-1$, $x=4$ and $x=2$. Thus was not necessary to use the trial method to find all values of x that satisfy the equation.

4.1. Graphical solution of the cubic.

Consider an example $x^3-5x^2+2x+8=0$. Consider ~~the~~ the equation $y=x^3+2x+8$. Now set up the following pairs of values:

x	-3	-2	-1	0	1	2	3	4	5	6	...
y	-70	[illegible]	0	8	6	0	-4	0	18	56	

We then locate each pair of values on a diagram, and join them in a smooth curve (fig 5).



Observe that when the graph crosses the x axis (at $x=-1$, $x=2$, and $x=4$), y has a value of zero. But when $y=0$, we have the original cubic equation. Hence, the roots of a cubic equation in x are the values of x which correspond to $y=0$ or the points of intersection with the x axis.

The graph sugests something useful for solving equations that canot be factored, for when it crosses the x axis the values of y just before and just after must differ in sign.

Consider the equation $x^3+x-3=0$. Let $y=x^3+x-3$. The following pairs of values can be set up:

x	-2	-1	0	1	2	3	...
y	-13	-5	-3	-1	7	27	...

Locate each pair of values on a diagram and join them!