3055 BA SANGAM COLLEGE

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WORKSHEET 10

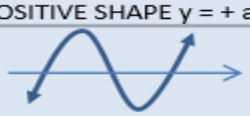
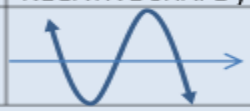
School: Ba Sangam College **Year / Level: 12**

Subject: Mathematics **Name of Student: _____**

Strand	3 – Graphs
Sub strand	3.1 – Graphs and Intersections
Content Learning Outcome	➢ Studying and interpreting graphs

Cubic Graphs that can be factorized (Ref: Year 12 Mathematics Pg 99 – 101)

Note: Cubic is derived from the word 'cube' which means power of 3 in algebra, i.e. the highest power of 3.

GRAPH	POSITIVE SHAPE $y = + a x^3$	NEGATIVE SHAPE $y = - a x^3$
Cubic function / graph		

To sketch the graph, follow **intercept** method from the linear and quadratics graph. Only new feature is that you will expect three x – intercepts [roots].

Also, if you see **square** then the point would be the vertex.

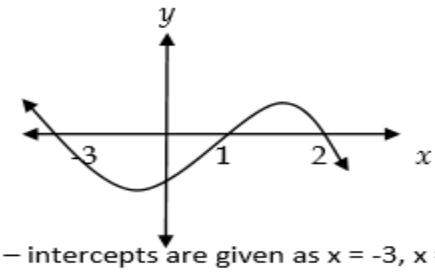
The **transformation of cubic** is exactly the same as quadratic transformation.

In general, the transformation of Cubic equation will have the form:

$$y = \pm a(x \pm b)^3 \pm c$$

Shape ± Stretching Shifting along x – axis Shifting along y – axis

EXAMPLE 1: Find the equation of the graph given below



The x – intercepts are given as x = -3, x = 1 and x = 2.

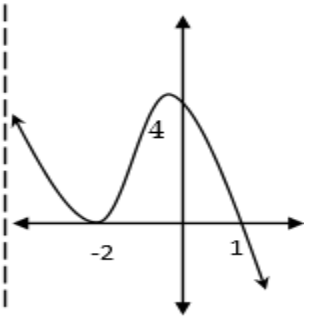
Take it on the left side with the x

x = -3, x = 1 x = 2

$(x+3)(x-1)(x-2)$ the shape is of negative coefficient so put a negative sign

Thus, $y = -(x-2)(x-1)(x+3)$

EXAMPLE 2: Sketch the graph of $y = (x+2)^2(1-x)$, show all the intercepts clearly.

Shape	x-int, let y = 0 and solve and draw smooth curve	y-int, let x = 0 and solve	plot
$y=-x^3$ 	$y=(x+2)^2(1-x)$ $0=(x+2)^2, 0=1-x$ $x=-2, x=1$	y $y=(0+2)^2(1-0)$ $=4\times1$ $y=4$	

The repeated factor in $y=(x+2)^2(1-x)$ that is $(x+2)^2$ means the graph turns at x=-2 as shown above

ACTIVITY

1. Sketch the following graphs:

$y=(3-x)(x-2)(x+1)$

(2 marks)

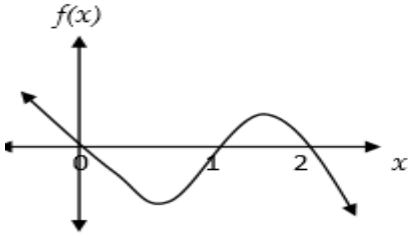
$y=(x+1)(x-3)^2$

(2 marks)

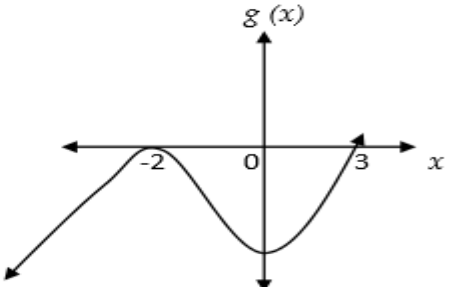
2.

Write the equation of the following graphs

a)



b)



(2 marks)

THE END