Student Activity 5(i)



Plot the following graphs using the same axes and scales where $x \in \{-3, -2, -1, 0, 1, 2, 3\}$ (Use the "Table" mode on the calculator and verify the y values you calculate - optional) (i) How does the graph of $y = x^3$ compare with the graph of $y = x^2$?

1. $y = x^3$	$3. y = 2x^3$
2. $y = -x^3$	4. $y = -2x^3$

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

L	 	- <u> </u>	30	f	 _!	 	 		(ii) How many real roots has
			26		- -	+	- -		$f(x) = x^3$? What are they?
		- L	22	• ·	_'	· +	-'	4	(iii) What is the effect of the
			18	• ·	-¦	· +	-¦		coefficient <i>a</i> on the graph of $y = ax^3$?
			16	.	- -	· +	-i	i	
L	· J	- <u> </u>	12		_	·	-		(iv) What is the effect of the
						·			sign of <i>a</i> on the graph of $y = ax^2$?
		- -	4		-' -	· +	- ' -		(vi) What transformation maps the graph of
		- -			-i	·	-i	i	
	-	-	0		+.	+	-		$y = x^3$ onto the graph of $y = -x^3$?
			-12	0	1	2	3	4	$y = x^3$ onto the graph of $y = -x^3$? (v) For what values of x is
			-12 4 6 6	. <u>0</u>	1 	2 	3 	4	$y = x^3$ onto the graph of $y = -x^3$? (v) For what values of x is the graph of $y = ax^3$ increasing?
	3 		-1 -2 -4 4 4 		1 	2	3 	4	y = x^3 onto the graph of $y = -x^3$? (v) For what values of x is the graph of $y = ax^3$ increasing? (vii) What are the turning points
		-2 	-1 -2 -4 -6 -6 -70 -10 -12 -14 -14 -16		-	2		4	y = x^3 onto the graph of $y = -x^3$? (v) For what values of x is the graph of $y = ax^3$ increasing? (vii) What are the turning points i.e. local max and local min of $y = x^3$?
		-2 	-1 -2 -4 -6 -6 -10 -12 -12 -14 -14 -16 -18			2	3	4 	y = x^3 onto the graph of $y = -x^3$? (v) For what values of x is the graph of $y = ax^3$ increasing? (vii) What are the turning points i.e. local max and local min of $y = x^3$?
			-1 -2 -4 -6 -6 -10 -12 -12 -14 -14 -14 -16 -18 -20 -22	0			3		y = x^3 onto the graph of $y = -x^3$? (v) For what values of x is the graph of $y = ax^3$ increasing? (vii) What are the turning points i.e. local max and local min of $y = x^3$?
			-1 -2 -4 -6 -6 -10 -12 -12 -14 -14 -14 -16 -18 -20 -22 -22 -24 -26	0					$y = x^{3}$ onto the graph of $y = -x^{3}$? (v) For what values of x is the graph of $y = ax^{3}$ increasing? (vii) What are the turning points i.e. local max and local min of $y = x^{3}$?