EXCELLING PARABOLIC FUNCTIONS

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Capricorn district: Seshego circuit Limpopo province

DURATION: 1 hour

TARGET AUDIENCE: FET educators

MAXIMUM NUMBER OF PARTICIPANTS: 30

MOTIVATION FOR THE WORKSHOP

Technology at present plays an important part in the teaching of Mathematics in our school according to the new curriculum (CAPS). Educators on the other hand need to equip themselves with technological equipments available in their schools. *Microsoft Excel* can assist educators a great deal because they can explore the effect of parameters on parabolic functions with ease.

ABSTRACT

Parabolic functions are dealt extensively in the FET band especially Grade 11. Learners are to explore the effect of parameters of parabolic functions. Learners are to determine the effect of parameters a, p and q. *Microsoft Excel* can clearly demonstrate the effect of parameters. This workshop will assist educators to teach functions using *Microsoft Excel* and they how to use *Microsoft Excel* to set tests and examination papers.

DESCRIPTION OF CONTENT OF WORKSHOP

Content Overview

Functions

Generate as many graphs as necessary, initially by means of point-by-point plotting, supported by available technology, to make and test conjectures and hence generalize the effects of the parameter which results in a horizontal shift and that which results in a horizontal stretch and/or reflection about the y axis.

Content Clarifications

Functions

Revise the effect of the parameters a and q and investigate the effect of p on the graphs of the functions defined by: $y = a(x + p)^2 + q$

Comment

Once the effects of the parameters have been established, various problems need to be set: drawing sketch graphs, determining the defining equations of functions from

Mabotja, R. (2013). Excelling parabolic functions. In Z. Davis & S. Jaffer (Eds.), *Proceedings of the 19th Annual Congress of the Association for Mathematics Education of South Africa*, Vol. 2. (pp. 45 – 47). Cape Town: AMESA.

sufficient data, making deductions from graphs. Real life applications of the prescribed functions should be studied.

PROPOSED TIME ALLOCATION FOR WORKSHOP ACTIVITIES

Activity	Time
Motivation for the workshop	03 Minutes
Abstract	02 Minutes
Description of content	05 Minutes
Activities	40 Minutes
Questions	10 Minutes

MATHEMATICS CONTENT

On the same set of axis draw graphs of the following function:

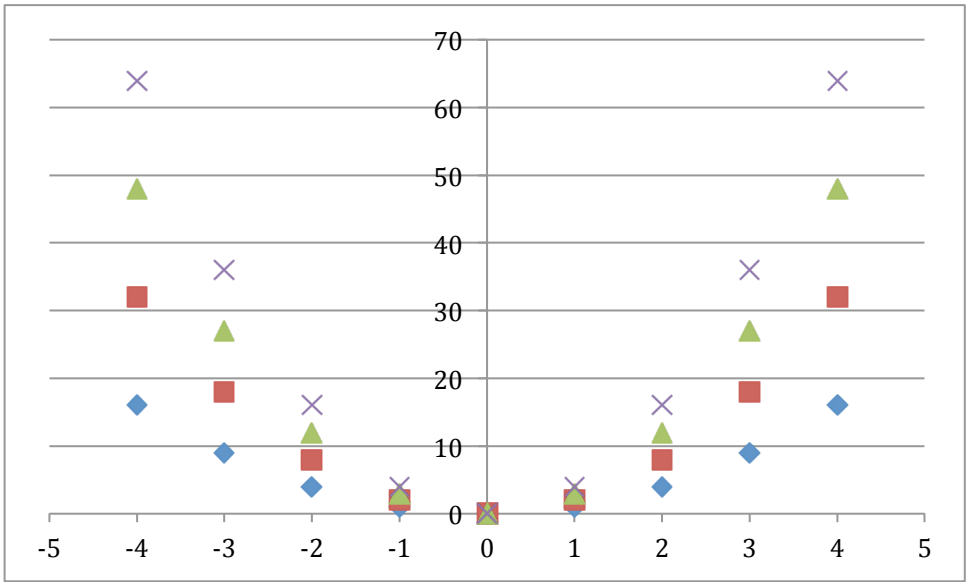
$y = x^2$, $y = 2x^2$, $y = 3x^2$ and $y = 4x^2$

Using *Microsoft Office Excel*:

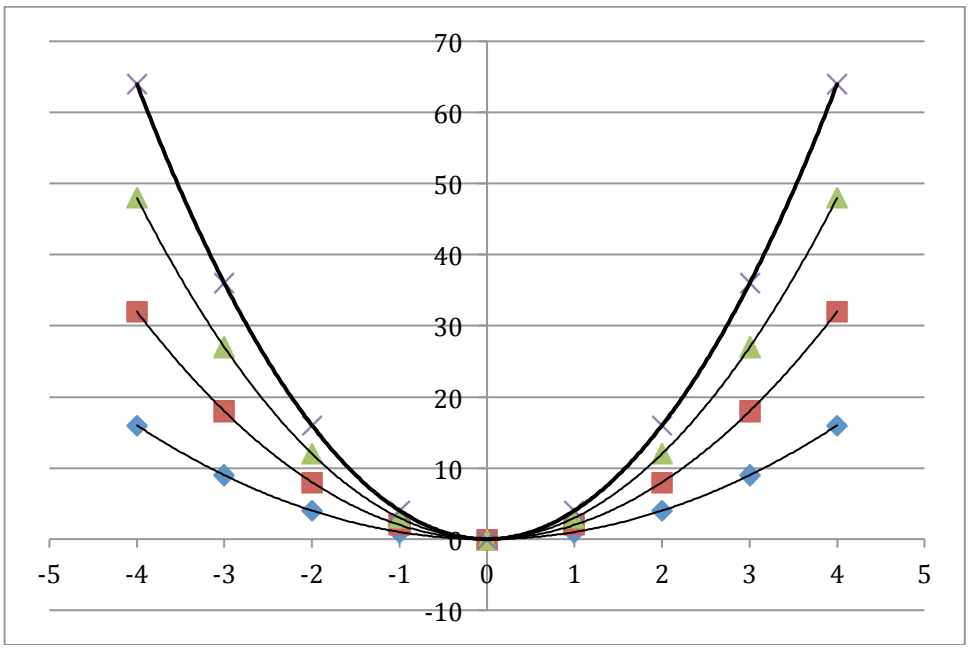
- *Open Microsoft Office Excel*
- In the *first* column: enter -4, -3 highlight them and drag them down
- In the *second* column: press [=] [A] [1] [shift 6] [2] [enter] highlight the result and drag them down
- In the *third* column: press [=] [2] [shift 8] [shift 6] [A] [1] [shift 6] [2] [enter] highlight the result and dreg them down
- In the *fourth* column: press [=] [3] [shift 8] [A] [1] [shift 6] [2] [enter] highlight the result and drag them down
- In the *fifth* column: press [=] [4] [shift 8] [A] [1] [shift 6] [2] [enter] highlight the result and drag them down

-4	16	32	48	64
-3	9	18	27	36
-2	4	8	12	16
-1	1	2	3	4
0	0	0	0	0
1	1	2	3	4
2	4	8	12	16
3	9	18	27	36
4	16	32	48	64

- Highlight the whole data set
- Click insert, scatter, scatter with only marker



- Right click a point, Add Trendline, Polynomial, Order 3 and close



CONCLUSION

Mathematics will never ever be a monster or a taboo in our school if educators can familiarize themselves with the use of computers and other technological equipment available in their schools.