LEARNING AS ONE NATION
Expanded Project

Math 10_24A

JHS LEARNING ACTIVITY

Name: _____ **Grade/Score:** _____
Grade and Section: _____ **Date:** _____

Subject *(Check or choose from below.)*

- ☐ Religion/Values Education
- ☐ Natural Sciences
- ☐ Araling Panlipunan
- ☐ Filipino
- ☐ English
- ☐ Math
- ☐ TLE / ICT
- ☐ MAPEH
- ☐ HGP _____

Type of Activity *(Check or choose from below.)*

- ☐ Concept Notes
- ☐ Skills: Exercise / Drill
- ☐ Performance Task
- ☐ Illustration
- ☐ Formal Theme
- ☐ Informal Theme
- ☐ Others: _____

Activity Title: Graphing Polynomial Functions

Learning Target: To graph a polynomial function.

References: *(Author, Title, Pages)*
https://www.augusta.k12.va.us/cms/lib01/va01000173/centricity/domain/766/chap07.pdf
V. J. A. Dublin, CVIF Learning Activities

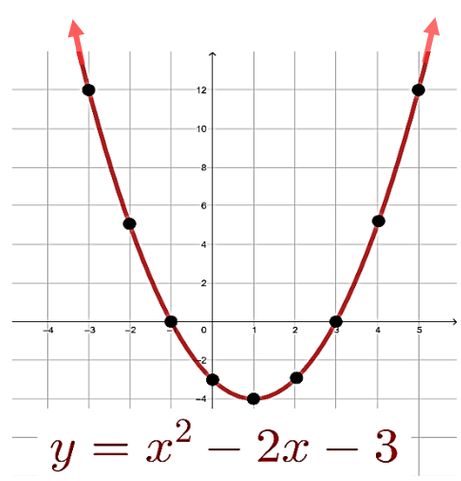
To graph a polynomial function, make a table of values to find several points and then connect them to make a smooth curve. Knowing what happens to the graph when x or y has very large values will then help in completing the sketch of the graph.

Example: Graph $\boldsymbol{f(x) = x^2 - 2x - 3}$ using the table of values.

x	-3	-2	-1	0	1	2	3	4	5
$f(x)$	12	5	0	-3	-4	-3	0	5	12

This is a polynomial of 2nd degree (n=2) with a positive coefficient for the quadratic term. We note that, as $x \to +\infty$ then $f(x) \to +\infty$ and as $x \to -\infty$ still $f(x) \to +\infty$.

The graph intersects the x-axis at two points, so the function has two real zeros.



Exercises:

Graph the following polynomial functions and indicate the x-intercepts and the y-intercept of the graph. Use graphing paper. (If none, draw a grid for your graph.)

1) $f(x) = x^3 - 2x^2 - x + 2$
2) $f(x) = x^4 - 20x^2 + 64$

LEARNING AS ONE NATION

Expanded Project

Math 10_24B

JHS LEARNING ACTIVITY

Name: _____ **Grade/Score:** _____

Grade and Section: _____ **Date:** _____

Subject *(Check or choose from below.)*

- ☐ Religion/Values Education
- ☐ Natural Sciences
- ☐ Araling Panlipunan
- ☐ Filipino
- ☐ English
- ☐ Math
- ☐ TLE / ICT
- ☐ MAPEH
- ☐ HGP _____

Type of Activity *(Check or choose from below.)*

- ☐ Concept Notes
- ☐ Skills: Exercise / Drill
- ☐ Performance Task
- ☐ Illustration
- ☐ Formal Theme
- ☐ Informal Theme
- ☐ Others: _____

Activity Title: Describing Graphs of Polynomial Functions

Learning Target: To identify general shapes of graphs of polynomial functions

References: *(Author, Title, Pages)*

https://www.augusta.k12.va.us/cms/lib01/va01000173/centricity/domain/766/chap07.pdf

V. J. A. Dublin, CVIF Learning Activities

To graph a polynomial function, it is very useful to know the following terms:

- **Degree** – highest exponent, usually denoted by n
- **Leading Coefficient** – the coefficient of the term with the highest degree
- **End Behavior** – the behavior of the graph as x approaches positive infinity $(+\infty)$ or negative infinity $(-\infty)$
- **Turning Points** – points at which the graph changes from increasing to decreasing behavior or vice versa. The graph has at most, $(n-1)$ turning points.

Exercises: For each polynomial function given in the exercises of the preceding learning activity sheet,

a) Give the degree. Is it positive or negative?

b) Give the leading coefficient. (Include its sign.)

c) State the number of real zeros (where the graph crosses the x-axis).

d) Comment on the end behavior of the graph. Is there a difference in behavior for an odd degree and even degree of a polynomial function?

e) Are there turning points? Indicate these in your graph by labelling the points.