## Math Virtual Learning

## Algebra 2A <br> Polynomial Parent Functions

May 19, 2020

## Lesson: <br> Sketching Polynomial Parent Functions

## Learning Target:

LT C2 I can identify key features (zeros, multiplicity, end behavior, y-intercept, local minimums and maximums, turning points, transformations).

## Objective:

Students will be able to identify parts of a graph.

## Warm Up

Match the equation to the correct graph

$$
f(x)=x^{2}-4 x+7
$$

$$
g(x)=-x^{2}-10 x-19
$$



## Warm Up Answers



$$
g(x)=-x^{2}-10 x-19
$$



$$
f(x)=x^{2}-4 x+7
$$

## Lesson

Today, we are going to start looking at how to graph a polynomial when it is in intercept form. First we are going to look at how to get the x-intercepts (zeros), y-intercepts, and end behavior.

Find the $x$ and $y$ intercepts from a polynomial in factored form:
https://www.youtube.com/watch?v= 94pvZfBzAy0
Ex 1: Find the Intercepts and the End Behavior of a Polynomial Function:
https://www.youtube.com/watch?v=EwiQEO2TOrk

## Practice

List the x-intercepts, y-intercepts, and end behavior and then graph each of the following

1. $y=(x+2)(x-1)$
2. $y=(x+2)^{2}(x-1)$
3. $y=(x+2)^{2}(x-1)^{2}$
4. $y=(x+2)(x-1)(x+3)(x-2)(x+1)$
5. $y=(x+2)(x-1)$
a. X-intercepts: $(-2,0)(1,0)$
b. Y-intercepts: $(0,-2)$
c. End behavior: degree of 2
a. $x \rightarrow \infty, f(x) \rightarrow \infty$
b. $x \rightarrow-\infty, f(x) \rightarrow \infty$
6. $y=(x+2)^{2}(x-1)$
a. X-intercepts: $(-2,0)(1,0)$
b. Y -intercepts: $(0,-4)$
c. End behavior: degree of 3

$$
\begin{array}{ll}
\text { a. } & x \rightarrow \infty, f(x) \rightarrow \infty \\
\text { b. } & x \rightarrow-\infty, f(x) \rightarrow-\infty
\end{array}
$$


3. $y=(x+2)^{2}(x-1)^{2}$
d. X-intercepts: $(-2,0)(1,0)$
e. $Y$-intercepts: $(0,4)$
f. End behavior: degree of 4
a. $\quad x \rightarrow \infty, f(x) \rightarrow \infty$
b. $x \rightarrow-\infty, f(x) \rightarrow \infty$

4. $y=(x+2)(x-1)(x+3)(x-2)(x+1)$
g. $X$-intercepts: $(-2,0)(1,0)(-3,0)(2,0)(-1,0)$
h. Y-intercepts: $(0,12)$
i. End behavior: degree of 5
a. $x \rightarrow \infty, f(x) \rightarrow \infty$
b. $x \rightarrow-\infty, f(x) \rightarrow-\infty$


