

## Chapter 3

Polynomial Functions... (these have their ups and downs!!!)

In this unit we will:

- study the characteristics of polynomial functions
- factoring higher level polynomial functions to find zeros
- "Cool" algebra with polynomial functions

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Learning Expectation:

By the end of today's lesson, we will be able to recognize a polynomial function, and understand some basic characteristics.

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These are polynomial expressions.	These are not polynomial expressions.
$3x^2 - 5x + 3$	$\sqrt{x} + 5x^3$
$-4x + 5x^7 - 3x^4 + 2$	$\frac{1}{2x + 5}$
$\frac{2}{5}x^3 - 3x^5 + 4$	$6x^3 + 5x^2 - 3x + 2 + 4x^{-1}$
$\sqrt{4x^3} - \frac{\sqrt{5}}{3}x^2 + 2x - \frac{1}{4}$	$\frac{3x^2 + 5x - 1}{2x^2 + x - 3}$
$3x - 5$	$4^x + 5$
$-7$	$\sin(x - 30)$
$-4x$	$x^2y + 3x - 4y^{-2}$
$(2x - 3)(x + 1)^2$	$3x^3 + 4x^{2.5}$

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## Names

1/  $y = mx + b$  **or**  $ax + by + c = 0$  \_\_\_\_\_

2/  $y = ax^2 + bx + c$  \_\_\_\_\_

3/  $y = ax^3 + bx^2 + cx + d$  \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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## Rules:

-the highest exponent on the  $x$  determines the degree of the polynomial expression and the type of polynomial function.

-the exponents must be whole numbers (no negative, no fractions)

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-The domain of a polynomial function is all real numbers

-The range of a polynomial function can be all real numbers or it may have an upper or lower limit (but not both)

-They have no asymptotes

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$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_2 x^2 + a_1 x + a_0$$
, where  $a_{n,n-1,\dots,2,1,0}$  are real numbers and  $n$  is a whole #

When...

$n=0$  horizontal line 

$n=1$  line 

$n=2$  parabola 

$n=3$  cubic

$n=4$  quartic

$n=5$  quintic

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## Chapter 3 homework

p122 #1-3

P127 #1, 2, 3, 4, 7

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