

Polynomial Notes

Vocabulary

Polynomial - An expression that can be written in the form $ax^n + bx^{n-1} + cx^{n-2} + \dots + z$

** Coefficients must be real #s (ex 1, $\frac{2}{3}$, $\sqrt{5}$)

** Exponents must be whole #s & positive (0, 1, 2 ... 900)

<u>Polynomial</u>	(simplify) <u># of Terms</u>	(highest exp) <u>Degree</u>	<u>Not Polynomials!!</u>
$25x^3 + 10x^2 - 3x + 5$	4	3	$\log x$
$172x^{99}$	1	99	$\sqrt{x} = x^{1/2}$
7	1	0	$\frac{5}{x+2}$
$x - 12$	2	1	
$\sqrt{6}x^5 - \frac{3}{2}x^7$	2	7	

Term - An expression that can be written ax^n (pieces of the polynomial)

Degree - The value of the highest exponent

Standard Form - Terms are in order from highest degree to lowest degree

Leading Coefficient - Coefficient of the highest degree

ex. $x^3 - 2x^4 + 7x$
 \uparrow
 LC: -2

Constant Term - Number by itself (no x , degree 0)

Example: $10x^2 + 5 + 3x + 25x^3$

Roots - The zeros of a function (the x -values when $y=0$)

x -int.

Factoring Notes

$$ax^2 + bx + c$$

↑
leading term
↑
middle term
↑
constant

<p>Common Factor</p> <ul style="list-style-type: none"> • find the GCF (what they <u>ALL</u> have in common) • divide each piece by GCF 	<p>ex1 $r^4y^6 + ry^4$ GCF: ry^4 * lowest exp. $\frac{r^4y^6}{ry^4} + \frac{ry^4}{ry^4} = r^3y^2 + 1$ GCF → $ry^4(r^3y^2 + 1)$</p>	<p>ex2 $9d^3 - 12d^2$ GCF: $3d^2$ $3d^2(3d - 4)$</p>
<p>Trinomial (a=1)</p> <p>* 3 pieces: $ax^2 + bx + c$</p> <p><u>2 questions</u></p> <ul style="list-style-type: none"> • what 2 #s multiply to get the constant (c)? • and add to get the middle # (b)? 	<p>ex1 $x^2 + 4x - 12$ ans: -2 & 6 $(x-2)(x+6)$</p>	<p>ex2 $x^2 - 8x + 15$ ans: -5 & -3 $(x-5)(x-3)$</p>
<p>Trinomial (a≠1)</p> <p>* 3 pieces: $ax^2 + bx + c$</p> <ul style="list-style-type: none"> • what are the factors of a? • what are the factors of c? <p>→ guess & check w/ OI to get b</p>	<p>ex $2x^2 + x - 10$ $\frac{2(a)}{2 \cdot 1} \quad \frac{-10(c)}{5 \cdot -2, -1 \cdot 10, 2 \cdot -5, -10 \cdot 1}$ $(2x+5)(x-2)$ OI check: $-4x + 5x = 1x$ $(2x+5)(x-2)$</p>	<p>ex2 $12x^3 + 31x^2 + 7x$ $x(12x^2 + 31x + 7)$ $\frac{12(a)}{6 \cdot 2, 2 \cdot 6, 3 \cdot 4, 4 \cdot 3, 1 \cdot 12, 12 \cdot 1} \quad \frac{7(c)}{1 \cdot 7}$ $x(4x+1)(3x+7)$ OI: $4x(7) + 1(3x) = 31x$ $x(4x+1)(3x+7)$</p>
<p>Difference of Squares</p> <p>* 2 terms & sub. sign</p> <ul style="list-style-type: none"> • both terms are perfect squares • find $\sqrt{\quad}$ of each term • +/- 	<p>ex1 $9x^2 - 4$ $\sqrt{9x^2} \rightarrow 3x \quad \sqrt{4} \rightarrow 2$ $(3x+2)(3x-2)$</p>	<p>ex2 $16x^2 - 81$ $\sqrt{16x^2} \rightarrow 4x \quad \sqrt{81} \rightarrow 9$ $(4x+9)(4x-9)$</p>