

Identifying  
Polynomial Parts  
Vocab

Your Name

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Notes

Factor

integer numbers or variables that make up a term by pairing up with another factor using multiplication, thus each are smaller

$$12: \underbrace{1, 2, 3, 4, 6, 12}$$

$$3x: 3 \text{ and } x$$

~~$$(x + 2)(x - 7): (x+2) \text{ and } (x-7)$$~~

Civil wars: economic interests, cultural values, the federal gov. control

factors

Multiple

more of a term, multiply the term by numbers, thus each are bigger

$$12: 12, 24, 36, 48, \dots$$

$\begin{matrix} 1st & 2nd & 3rd & 12 \cdot 4 \\ \text{multiple} & \text{multiple} & \text{multiple} & \underline{\quad} \\ & 12 \cdot 2 & 12 \cdot 3 & \end{matrix}$

$$3x: 3x, 6x, 9x, \underline{12x}, \underline{15x}, \dots$$

$\begin{matrix} 3 \cdot 1 \cdot x & 3 \cdot 2 \cdot x & 3 \cdot 3 \cdot x & 3 \cdot 4 \cdot x \end{matrix}$

Civil Wars: English Civil War, American Union/Confederate, Israel/Palestine Conflict, Colombia Civil War, Philippines Civil War, North/South Korea, Indonesia, French Revolution, Mexican Revolution, Russian Civil War...

multiple civil wars

Prime Number

A whole number, greater than 1, whose only factors are 1 and itself

ex. 41 : 1, 41  
only factors

1 is not prime  
start at 2

Composite Number

A whole number, greater than 1, that has more than two factors

ex. 90 : 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90  
no more numbers in between for factors

Trick 2 : even cut in half

Trick 3 : add digits if sum is divisible by 3  
 $9 + 0 = \frac{9}{3} = 3 \checkmark$

231

Trick 4 : cut in half twice

Trick 5 : ends in 0 or 5

Trick 6 : if both 2 and 3 are factors

Trick 8 : cut in half 3 times

Trick 9 : add digits, if sum divisible by 9  
 $9 + 0 = \frac{9}{9} = 1 \checkmark$

Trick 10 : ends in 0

Monomial/  
Term

the multiply product of rationals and variables possibly with exponents (no addition or subtraction)

ex.  $32x^2$

Degree of  
a term

the add sum of the term's variable exponents

ex.  $32x^{\textcircled{2}}$

Degree is 2

ex.  $49a^{\textcircled{3}}b^{\textcircled{2}}$

$3 + 2 = 5$

Degree is 5

Standard  
Form

terms in order of Degree highest to lowest

ex.  $3x^1 - 5x^2 \rightarrow -5x^2 + 3x$   
 $D:1 \quad D:2$

Lead  
Coefficient

Number in front of highest degree term

ex.  $3x^4 + 7x^2 - 49x^0$       ex.  $5 - 13x^7 + 100x^1$   
 $D:4 \quad D:2 \quad D:0$        $D:0 \quad D:7 \quad D:1$   
Lead coefficient is: 3      L.C.: -13

\*Not after the biggest #

Constant

Number in front of zero degree term,  
(the term without a variable)

ex.  $3x^4 + 7x^2 - 49$       ex.  $5 - 13x^7 + 100x$   
 Constant: -49      Constant: 5

# Naming Polynomials

Polynomial  
by Terms

Count the # of Terms. Terms are separated by addition and subtraction signs

Must have at least two monomial terms

Binomial	Trinomial	4 term polynomial	n term polynomial
<p><u>2</u> terms</p> <p><math>x + 4</math></p> <p><math>3x^2 - 7</math></p> <p><math>x^3 + 1</math></p> <p>1st term    2nd term</p>	<p><u>3</u> terms</p> <p><math>x^2 + 4x + 5</math></p> <p><math>2x^3 + x^2 - 1</math></p> <p><math>2 \cdot 1x^4 + x + 100</math></p> <p>1    2    3</p>	<p><u>4</u> terms</p> <p><math>x^4 + x^2 + x^2 + x + 1</math></p> <p>1    2    3    4    5</p> <p>5 term polynomial</p>	<p><math>x^m + x^{m-1} + \dots + x^0</math></p> <p>'n' number of terms</p>

# Naming Polynomials

Polynomial by Degree the biggest degree of any of the polynomial's terms

ex.  $3x^2 - 6x + 1$   
 $D: 2 \quad D: 1 \quad D: 0$   
 Degree is 2

ex.  $4a^3b^2 + b^3 - 5ab + 9a$   
 $D: 5 \quad D: 3 \quad D: 2 \quad D: 1$   
 Degree is 5

if all some variable  
 if different variables

**Linear**  
1st Degree  
 $8x$  or  $8x^1$   
 $\frac{1}{2}x + 7$   
 $-2x + y$

**Quadratic**  
2<sup>nd</sup> Degree  
 $8x^2$   
 $1.4x^2 + 20x - 5$   
 $-2x + y^2$

**Cubic**  
3<sup>rd</sup> Degree  
 $8x^3$   
 $81 - 27x^3$   
 $11ab^2$

if all some variable  
 if different variables

**Quartic**  
Degree 4  
 $x^4$   
 $2x^4 + x^3 + 4x^2 + 2x - 7$   
 $x^4 - x^2 - 7$

**Quintic**  
Degree 5  
 $x^5$   
 $7.1x^5 - 30$   
 $x^4 - 1.5 - 7$

6th degree Polynomial  
Degree 6  
 $x^6$

nth degree Polynomial  
Degree n  
 $x^n$

Missing cubic and linear terms

$x^4 + 0x^3 + 1x^2 + c - 7$

$-2x^6 - 3x^4 + 100$   
 $21x^4y^2 + xy + x^2 - 10x$   
 biggest exponent  
 $x^n + x^{n-1} + x^{n-2} + \dots + x^0$

# Identifying Polynomial Parts Homework

Find the following for each polynomial	Leading Coefficient Constant	Degree # of Terms	Type of Polynomial by Degree and Terms	Factors of Each Term	Write in Standard Form
$5x - 10x^2 + 20$	The Leading Coefficient is -2 The Constant is 20	Degree 2 3 terms	Quadratic Trinomial	5 and x -1,2,5,10, x, x 1,2,4,5,10,20	$-2x^2 + 5x + 20$
8 or $8x^0$	No L.C. C: 8	D: 0 1 term	Constant monomial	1, 2, 4, 8	8
$3y^2 + 0$	LC: 3 C: 0	D: 2 1 term	Quadratic Monomial	1, 3, y, y	
$1r^3 + 4 - r^1 + s^2$ D: 3 D: 0 D: 1 D: 2	LC: 1 C: 4	D: 3 4 terms	3rd degree 4 term polynomial	r, r, r 1, 2, 4 -1, r s, s	$r^3 + s^2 - r + 4$
$5x^2y^4 - 4$					
$15x^3y^2z$					
$r^3 - 3 - r - r^5$					
$25x^2 - 16x^4$					
$8x^2 - 13x + 5$					
$-7x + -9 + 4x^3$					
$-6 + \frac{3}{4}x^1$ D: 0 D: 1	LC: $\frac{3}{4}$ C: -6	D: 1 2 terms	Linear binomial	-1, 1, 2, 3, 6 $\frac{3}{4}$ and x $\frac{1}{4}$ and 3	$\frac{3}{4}x - 6$



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8	No LC C: 20	D: 0 1 term	Constant monomial	1, 2, 4, 8	8
$3y^2$	LC: 3 C: 0	D: 2 1 term	Quadratic monomial	1, 3, y, y	$3y^2$
$r^3 + 4 - r + s^2$	LC: 1 C: 4	D: 3 4 terms	3rd degree 4 term Polynomial	r, r, r 1, 2, 4 -1, r 1, s, s	$r^3 + s^2 - r + 4$
$5x^2y^4 - 4$	LC: 5 C: -4	D: 6 2 terms	6th degree Binomial	1, 5, x, x, y, y, y, y -1, 2, 4	$5x^2y^4 - 4$
$15x^3y^2z$	LC: 15 C: 0	D: 6 1 term	6th degree monomial	1, 3, 5, 15, x, x, x y, y, z	$15x^3y^2z$
$r^3 - 3 - r - r^5$	LC: -1 C: -3	D: 5 4 term	Quintic Fifth degree 4 term polynomial	r, r, r -1, 3 -1, r -1, r, r, r, r, r	$-r^5 + r^3 - r - 3$
$25x^2 - 16x^4$	LC: -16 C: 0	D: 4 2 terms	Quartic Binomial	1, 5, 25, x, x -1, 2, 4, 8, 16, x x, x, x	$-16x^4 + 25x^2$
$8x^2 - 13x + 5$	LC: 8 C: 5	D: 2 3 terms	Quadratic Trinomial	1, 2, 4, 8, x, x -1, 13, x 1, 5	$8x^2 - 13x + 5$
$-7x + -9 + 4x^3$	LC: 4 C: -9	D: 3 3 terms	Cubic Trinomial	-1, 7, x -1, 3, 9 1, 2, 4, x, x, x	$4x^3 - 7x - 9$
$-6 + \frac{3}{4}x$	LC: $\frac{3}{4}$ C: -6	D: 1 2 terms	Linear Binomial	-1, 2, 3, 6 $\frac{3}{4}, x$	$\frac{3}{4}x - 6$