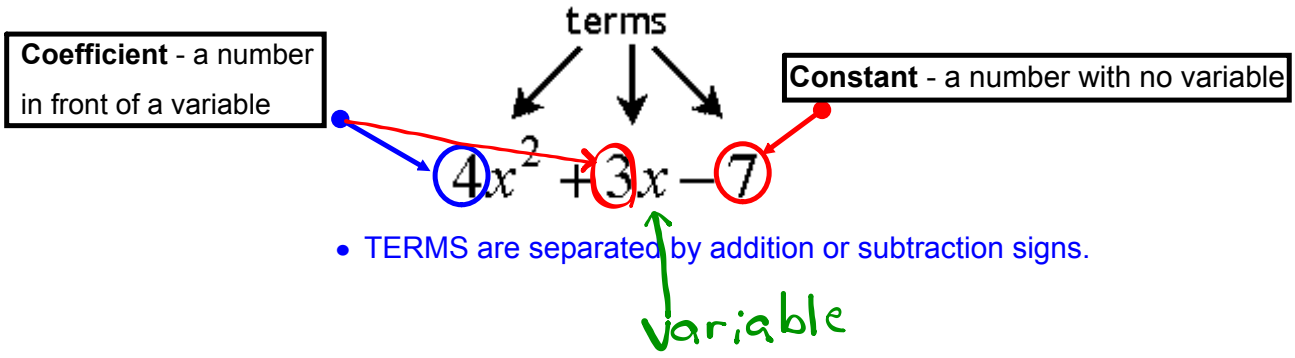
Polynomials

By now, you should be familiar with variables and exponents. You may have dealt with expressions like $3x^4$ or $6x$. Polynomials are sums of these expressions. Each piece of the polynomial, each part that is being added, is called a "term". Polynomial terms have variables to whole-number exponents; there are no square roots of exponents, no fractional powers, and no variables in the denominator. Here are some examples:

$6x^{-2}$	NOT a polynomial term	This has a negative exponent.
$1/x^2$	NOT a polynomial term	This has the variable in the denominator.
$\sqrt{x}$	NOT a polynomial term	This has the variable inside a radical.
$4x^2$	a polynomial term	

Here is a typical polynomial:



$4x^2 + 2x^2 + 5x + 1$

$6x^2 + 5x + 1$... really 3 terms

✓ $3x^2$ 1 term Monomial

✓ $5x+7$ 2 terms Binomial

✓ $3x^2+5x+7$ 3 terms Trinomial

$6x^3+2x^2+3x+1$ 4 or more terms Polynomial with ___ terms

Expanding and Simplifying:

- Collecting Like Terms

Probably the most common thing you will be doing with polynomials is "combining like terms". This is the process of adding together whatever terms you can, but not overdoing it by adding together terms that can't actually be combined.

Terms can be combined if they have the exact same variable part. Here is a rundown of what's what:

LIKE TERM - exact same variable(s)

Examples:

1) $3x + 4x$ = $7x$

2) $2x^2 + 3x - 4 - x^2 + x + 9$

$2x^2 - x^2 + 3x + x - 4 + 9$

$x^2 + 4x + 5$

3) $10x^3 - 14x^2 + 3x - 4x^3 + 4x - 6$

$6x^3 - 14x^2 + 7x - 6$

4) $-4y - [3x + (3y - 2x + \{2y - 7\}) - 4x + 5]$

$-4y - [3x + 5y - 2x - 7 - 4x + 5]$

$= -4y - [-3x + 5y - 2]$

$= -4y + 3x - 5y + 2$

$= -9y + 3x + 2$

• Distributive Property

The Distributive Property is easy to remember, if you recall that "multiplication *distributes* over addition and subtraction".

Formally, this property is displayed as...

$$a(b+c) = ab + ac$$

Examples:

1) $3(2x-5)$ = $6x-15$

2) $3a(2a+4)$ = $6a^2+12a$

3) $7x^2y(3x^2y+4xy-2y)$ = $21x^4y^2+28x^3y^2-14x^2y^2$

Multiplying Polynomials...

1) $(x-3)(x+7)$ $= x^2+7x-3x-21$
$= x^2+4x-21$

2) $(2x+1)(7x-6)$

3) $(3a-4b)(2a-b)$

4) $(5x-3)(5x+3)$

5) $2(4x-3)(2x+3)$

6) $(3y-2)(4y^2+5y-3)$

3) $(3a-4b)(2a-b) = 6a^2-3ab-8ab+4b^2$
$= 6a^2-11ab+4b^2$

4) $(5x-3)(5x+3) = 25x^2+15x-15x-9$
$= 25x^2-9$

5) $2(4x-3)(2x+3) = (8x-6)(2x+3)$
$= 16x^2+24x-12x-18$
$= 16x^2+12x-18$

6) $(3y-2)(4y^2+5y-3)$

Homework

Worksheet:

Add / Subtract & expand Polynomials

***FPCM 10*:**
Page 186: #6 to #12 & #15
Page 187: #16, #17 & #19

Attachments

Adding+Subtracting Polynomials.pdf