Algebra 1

Chapter 8

Section 8-1

A rectangle has a length that is three inches more than its width. Write an equation that gives the relationship between the width and the area of the rectangle.

$y = x + 3$

$L = w + 3$

$A = L \cdot w$

$A = (w+3)\,w$

$A = w^2 + 3w$

Concepts

Monomial -- a "term", made up of a real number, a variable, or the product of a real number and variables. All must have whole number exponents

Polynomial -- Monomial or the sum of monomials w^2+3w $4x-2y$

Binomial -- A polynomial that has exactly two monomials or terms.

Trinomial -- A polynomial that has exactly three monomials or terms.

$7x^2+2x-15$

The *degree* of a monomial is the total sum of the exponents of its *variables*.

- *What is the degree of each monomial?*

$k^5m^8n^2$ 15

$14h^9j^{10}$ 19

x^8yz^3 12

18 0

$6ad$ 2

Standard form of a polynomial

$$x^4 + 7x^2 + 8x - 7$$

Degree: 4 2 1 0

Standard form orders the terms of a polynomial from highest degree to lowest degree from left to right

The degree of the polynomial is the same as the monomial with the highest exponent.

Degrees of Polynomials

Polynomial	Degree	Name Using Degree
6	0	Constant
$5x + 9$	1	Linear
$4x^2 + 7x + 3$	2	Quadratic
$2x^3$	3	Cubic
$8x^4 - 2x^3 + 3x$	4	Fourth degree

Degree and Number of Terms

Polynomial	Degree	Name Using Degree	Number of Terms	Name Using Number of Terms
6	0	Constant	1	Monomial
$5x + 9$	1	Linear	2	Binomial
$4x^2 + 7x + 3$	2	Quadratic	3	Trinomial
$2x^3$	3	Cubic	1	Monomial
$8x^4 - 2x^3 + 3x$	4	Fourth degree	3	Trinomial

Classify the polynomial by the degree and number of terms

- $4x^2 - 8$ Quadratic Binomial
- $x^4 + 9x^2 - x$ 4th Degree Trinomial
- $10x + x^3$ Cubic Binomial
- $9x$ Linear Monomial

Review: Like Terms

Simplify the expressions

$4x + 7 + 3x$

$7x+7$

$9 - 2x + 7$

$16-2x$

$2y - 3x + 1 - 4y$

$-2y-3x+1$

$1-2y-3x$

Adding or Subtracting Polynomials

Simplify, if possible, by combining like terms

$17ab^2 + 3ab^2$

$20ab^2$

$9r^4st^2 - 2rs^4t^2$

Not possible

$11 - 8xy^2 + x + 1xy^2$

$-7xy^2+x+11$

Adding or Subtracting Polynomials

Using the vertical method

$$\begin{array}{r} 17x^2 + 3x - 6 \\ +\ 2x^2 - 4x + 1 \\ \hline 19x^2 - x - 5 \end{array}$$

$$\begin{array}{r} x^3 + 7x^2 + 8x - 6 \\ -(9x^3 + 4x^2 - 2x - 7) \\ \hline -8x^3 + 11x^2 + 6x - 13 \end{array}$$

Adding or Subtracting Polynomials

Using the horizontal method

$(12x^4 + 5x^2 - 13) + (12x^3 - 9x^2 + 3x - 2) =$

$12x^4 + 12x^3 - 4x^2 + 3x - 15$