Lesson 10

Introduction to Polynomials

Lesson

A polynomial is an expression with one or more terms, where each term is a number times a variable raised to a whole-number exponent.

Examples:

```
3x^2 + 5x - 7      (a trinomial -- 3 terms)
4y - 1             (a binomial -- 2 terms)
6x^3               (a monomial -- 1 term)
```

The degree of a polynomial is the highest exponent.

To add or subtract polynomials, combine like terms.
To multiply a monomial by a polynomial, use the distributive property.

Example: Add (3x^2 + 2x - 5) + (x^2 - 4x + 8)

Group like terms:

```
x^2 terms:  3x^2 + x^2  = 4x^2
x terms:    2x + (-4x)  = -2x
constants:  -5 + 8      = 3
```

Result: 4x^2 - 2x + 3

Practice Problems

1) Add: (2x^2 + 3x + 1) + (x^2 - x + 4)

2) Subtract: (5y^2 + 2y) - (3y^2 - y + 6)

3) Multiply: $3x(x^2 + 4x - 2)$

4) What is the degree of $7a^3 - 2a^2 + a - 9$?

5) Simplify: $(4m^2 - m + 3) + (2m^2 + 5m - 7)$

6) Simplify: $2x(3x + 5) - x(x - 1)$

7) A rectangle has length $(x + 3)$ and width $(2x - 1)$.
    Write an expression for its area and expand it.