Multiplication of Polynomials

Ex 1.

Multiply: $-3x^3y^2(4x^2y + 2y^2 - 8)$

Ex 2.

Multiply: $(2x + 5)(x^2 + 3x + 4)$

Note:

When multiplying two binomials, the mnemonic **FOIL** is sometimes helpful.

FOIL stands for **F**irst **O**uter **I**nner **L**ast.

For example, $(3x - 1)(2x + 4) = \underbrace{3x \cdot 2x}_{\text{First}} + \underbrace{3x \cdot 4}_{\text{Outer}} - \underbrace{1 \cdot 2x}_{\text{Inner}} - \underbrace{1 \cdot 4}_{\text{Last}}$

Some Shortcuts

$(A + B)^2 =$

$(A - B)^2 =$

$(A + B)(A - B) =$

We can use these shortcuts to multiply certain polynomials.

Ex 3.

Multiply: $(2x + 3y)^2$

Ex 4.

Multiply: $\left(\frac{1}{2}x - 3y^4\right)^2$

Ex 5.

Multiply: $(3xy^2 + 5y)(3xy^2 - 5y)$

Ex 6.

Suppose $f(x) = 3x^2 - x$. Find $f(a + h) - f(a)$.

Practice

1. Multiply: $-5xy(8x + 3y - 2x^2y^3)$

2. Multiply: $(3x - y)(2x + 5y)$

3. Multiply: $(x^2 - 2x + 3)(x^2 + x + 1)$

4. Multiply: $(xy^2 + 3)(x^2y^2 - 2xy + 5)$

5. Multiply: $(3x + 4y)^2$

6. Multiply: $(5xy^2 - xy)^2$

7. Multiply: $(3x + 2)(3x - 2)$

8. Suppose $f(x) = x^2 - 4x + 9$. Find $f(a + 2)$.

9. Suppose $f(x) = x^2 - 4x + 9$. Find $f(a + h) - f(a)$.

Q: What belongs to you but others use it more than you do?