Bell Work

$$(x^2+3x-4) \div (x-1)$$

Factoring Polynomials

Previously, you factored quadratic polynomials. You can also factor polynomials with degree greater than 2. Some of these polynomials can be *factored completely* using techniques you have previously learned. A factorable polynomial with integer coefficients is **factored completely** when it is written as a product of unfactorable polynomials with integer coefficients.

Factor Completely

$$x^3 - 4x^2 - 5x$$

Factor Completely

$$3y^5 - 48y^3$$

Factor Completely

$$5z^4 + 30z^3 + 45z^2$$

Factor Completely

$$2x^3 + 20x^2 + 48x$$

KEY IDEA

Special Factoring Patterns

Sum of Two Cubes

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

Example

$$64x^3 + 1 = (4x)^3 + 1^3$$
$$= (4x + 1)(16x^2 - 4x + 1)$$

Difference of Two Cubes

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

Example

$$27x^3 - 8 = (3x)^3 - 2^3$$
$$= (3x - 2)(9x^2 + 6x + 4)$$

Factor Completely

$$x^3 - 125$$

Factor Completely

$$x^3 - 64$$

Factor Completely

$$16s^5 + 54s^2$$

Factor Completely

$$6z^5 - 750z^2$$