

# Factoring

## Introduction to Factoring

Factoring polynomials is the reverse process of multiplication of polynomials. Factoring a polynomial means taking one polynomial and expressing it as a product of two or more polynomials. Not all polynomials can be factored. If they cannot be factored then we call that polynomial a prime polynomial similar to a prime number. A prime polynomial is a polynomial whose factors are just 1 and the polynomial itself.

Example of polynomials in factored form:

$$12x^2 - 18x = 6x(2x - 3)$$

How can you check your factoring? \_\_\_\_\_

## FACTORIZING WHEN TERMS HAVE A COMMON FACTOR

The very first step when factoring polynomials is to look for factors common to every term and then use the reverse of the distributive property:  $ac + ad = a(c + d)$ . When factoring out common terms, make sure you are factoring out the greatest common factor (GCF). For example, although 3 is a common factor between 6 and 12, the greatest common factor between 6 and 12 is 6.

Examples: Factor

1)  $6y^2 + 3y$

2)  $20abc - 14ab =$

3)  $-2x^2 + 12x + 40$

4)  $25a^3b^5 + 50a^4b^4 - 15a^5b^2$

5)  $xy + xyz + wy + wyz$

6)  $3a^3 - 9a^2 + 3a - 9a$

7)  $x^3 - 5x^2 + 9x - 45x$

8)  $5m^2p + 15mp - 2mpr - 6pr$

9)  $15xyz + 30xyz - 60xy$

10)  $25x^3 - 30x^5 + 35x$

11)  $a^3b^2 + ab^3$

12)  $8x^3 - 48x^2 + 72x$