

Objective: to solve polynomial equations by factoring.

Warm-up: Factor each of the following polynomials.

a. $n^2 + 7n + 10$

b. $6m^2 - 18m + 12$

General Factoring Strategies

1. Check for common factors. If the terms have common factors, factor out the GCF first.
2. Determine the number of terms in the polynomial.
 - Factor four-term polynomials by grouping by placing all the terms in the box and factoring out the GCF
 - Factor trinomials using the “box method” or the AC method
 - Factor binomials using the *Difference of Squares*: $a^2 - b^2 = (a + b)(a - b)$
3. Look to see if it can be factored further. If so, continue to factor using the methods above.
4. Check by multiplying to make sure you can return to the original expression.

What does “solving” mean?

For our purposes, solving means finding the “**roots**” (or zeros/x-intercepts). A root is where the function is **equal to zero**.

Examples: Solve each of the following polynomials.

a. $6x^2 + x - 15$

b. $2x + 1$

c. $3x^2 - 11x - 4$

d. $x^3 - 3x^2$

e. $x^3 + 8x^2 = -16x$

f. $x^2 - 11x + 19 = -5$

g. $16x^3 + 32x^2 - 9x - 18$