



Algebra1Coach.com

Factoring $x^2+bx + c$

Unit 8 Lesson 5

Factoring x^2+bx+c

Students will be able to:

Factor and perform multiplication of Polynomials specifically
Binomials.

Key Vocabulary:

- Factorization
- Middle term breaking



Factoring x^2+bx+c

Steps in Factoring x^2+bx+c :

- Step 1:** split x^2 into its factor, x and x .
- Step 2:** Split the last term c , into two factors whose product is c and whose sum is b .
- Step 3:** Write the usual binomial factor such as:

$$x^2 + bx + c = (x + c)(x + c)$$

Where bx is the sum of the middle term (inner and outer term).

Factoring x^2+bx+c

Sample Problem 1: Factor the following polynomials in form.

1. $a^2 + 5a + 6$

2. $x^2 - 4x + 4$

3. $b^2 - 8b + 16$

4. $y^2 + 15y + 56$

5. $x^2 - 20x - 300$


Sample Problem 1: Factor the following polynomials in form.

$$1.a^2 + 5a + 6$$

Solution:

$$a^2 = (a)(a) \quad 5a = 3a + 2a \quad 6 = (3)(2)$$

then


$$(a + 3)(a + 2)$$

Factoring x^2+bx+c

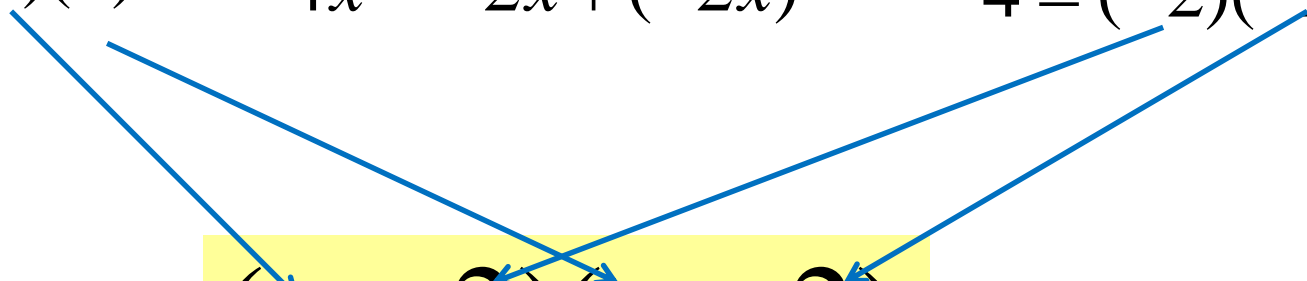
Sample Problem 1: Factor the following polynomials in form.

$$2.x^2 - 4x + 4$$

Solution:

$$x^2 = (x)(x) \qquad -4x = -2x + (-2x) \qquad 4 = (-2)(-2)$$

then


$$(x - 2)(x - 2)$$



Factoring x^2+bx+c

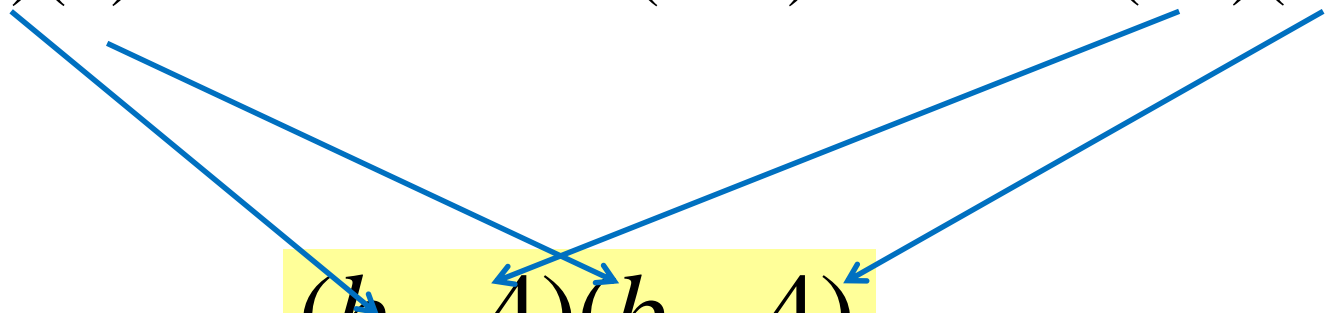
Sample Problem 1: Factor the following polynomials in form.

$$3.b^2 - 8b + 16$$

Solution:

$$b^2 = (b)(b) \quad -8b = -4b + (-4b) \quad 16 = (-4)(-4)$$

then


$$(b - 4)(b - 4)$$

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Sample Problem 1: Factor the following polynomials in form.

$$4.y^2 + 15y + 56$$

Solution:

$$y^2 = (y)(y)$$

$$15y = 8y + 7y$$

$$56 = (8)(7)$$

then


$$(y + 8)(y + 7)$$

Factoring x^2+bx+c

Sample Problem 1: Factor the following polynomials in form.

$$5x^2 - 20x - 300$$

Solution:

$$x^2 = (x)(x) \quad -20x = -30x + 10x \quad -300 = (-30)(10)$$

then

$$(x - 30)(x + 10)$$