

Factoring $x^2 + bx + c$ Notes

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).

Sample problem 1: Factor the following polynomials in $x^2 + bx + c$ form.

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

Answer:

$$a^2 = (a)(a)$$

$$6 = (3)(2)$$

$$5a = 3a + 2a$$

Then

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

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

Answer:

$$x^2 = (x)(x)$$

$$4 = (-2)(-2)$$

$$-4x = -2x + (-2x)$$

Then

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

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

Answer:

$$b^2 = (b)(b)$$

$$16 = (-4)(-4)$$

$$-8b = -4b + (-4b)$$

Then

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

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

Answer:

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

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

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

Then

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

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

Answer:

$$x^2 = (x)(x)$$

$$-300 = (-30)(10)$$

$$-20x = -30x + 10x$$

Then

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