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Factoring $ax^2+bx + c$

Unit 8 Lesson 6

Factoring ax^2+bx+c

Students will be able to:

Factor polynomials in ax^2+bx+c form.

Key Vocabulary:

- Factoring
- First term
- Middle term
- Last term



Factoring ax^2+bx+c

Factoring ax^2+bx+c :

let: $ax^2 + bx + c = (ex + f)(gx + h)$

where bx is the sum $(f)(gx)$ and $(ex)(h)$; ax^2 is the product of ex and gx ; and c is a product of f and h .

Factoring ax^2+bx+c

Factoring ax^2+bx+c :

Step 1: split ax^2 into its factors ex and gx ;

Step 2: Split the last term c , into two factors f and h whose product is c ;

Step 3: make sure that the sum of the product $(f)(gx)$ and $(ex)(h)$ is equal to the middle term bx .

Step 3: Write the usual binomial factor such as $ax^2 + bx + c = (ex + f)(gx + h)$ where bx is the sum of the middle term (inner and outer term).

$$ax^2 + bx + c = (ex + f)(gx + h)$$

Factoring ax^2+bx+c

Sample Problem 1: Factor the following polynomials in ax^2+bx+c form.

$$1. 2a^2 + 7a + 6$$

$$2. 6x^2 - 10x + 4$$

$$3. 4b^2 - 16b + 16$$

$$4. 8y^2 + 44y + 56$$

$$5. 2x^2 - 10x - 300$$

Factoring ax^2+bx+c

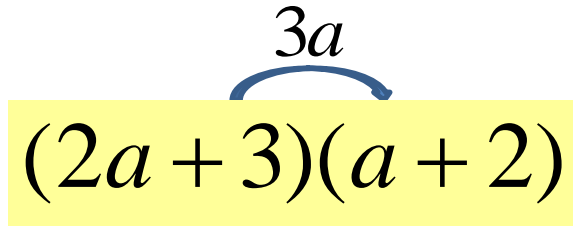
Sample Problem 1: Factor the following polynomials in ax^2+bx+c form.

$$1. 2a^2 + 7a + 6$$

Solution: $2a^2 = (2a)(a)$

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

then


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

where

$$7a = 3a + 4a$$

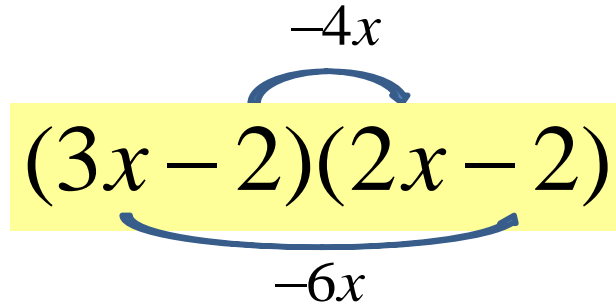
Factoring ax^2+bx+c

Sample Problem 1: Factor the following polynomials in ax^2+bx+c form.

$$2.6x^2 - 10x + 4$$

Solution: $6x^2 = (3x)(2x)$ $4 = (-2)(-2)$

then


$$(3x - 2)(2x - 2)$$

where

$$-10x = -4x + (-6x)$$

Factoring ax^2+bx+c

Sample Problem 1: Factor the following polynomials in ax^2+bx+c form.

$$3.4b^2 - 16b + 16$$

Solution: $4b^2 = (2b)(2b)$ $16 = (-4)(-4)$

then

$$(2b - 4)(2b - 4)$$

where

$$-16b = -8b + (-8b)$$

Factoring ax^2+bx+c

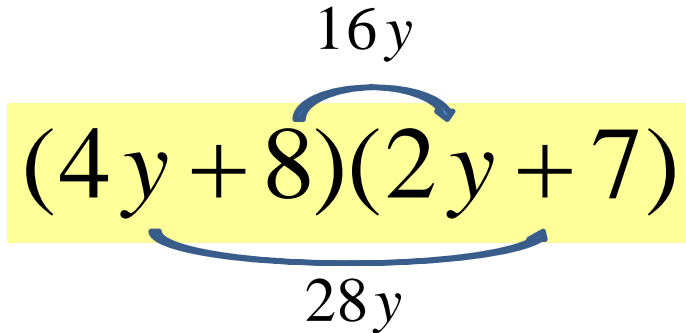
Sample Problem 1: Factor the following polynomials in ax^2+bx+c form.

$$4.8y^2 + 44y + 56$$

Solution: $8y^2 = (4y)(2y)$

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

then


$$(4y + 8)(2y + 7)$$

where

$$44y = 16y + 28y$$

Factoring ax^2+bx+c

Sample Problem 1: Factor the following polynomials in ax^2+bx+c form.

$$5.2x^2 - 10x - 300$$

Solution: $2x^2 = (2x)(x)$

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

then

$$(2x - 30)(x + 10)$$

where

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