

Lesson 1.4: Factoring Trinomials of the Form $x^2 + bx + c$ (Simple Trinomials)

Specific Outcome: 5.2 – Model factoring of a trinomial, concretely or pictorially, and record the process symbolically. 5.4 – Identify and explain errors in a polynomial factorization. 5.5 – Factor a polynomial, and verify by multiplying the factors. 5.8 – Express a polynomial as a product of its factors.

A. FACTOR USING ALGEBRA TILES

Factor: $x^2 + 5x + 6$

Solution: _____

Practice:

a) $x^2 + 5x + 4$

B. FACTOR USING SUM/PRODUCT METHOD

The following are examples of trinomials that have been factored into two binomial factors.

$$x^2 + 7x + 6 = (x + 6)(x + 1)$$

$$x^2 + 7x + 12 = (x + 4)(x + 3)$$

$$x^2 - 9x + 20 = (x - 5)(x - 4)$$

$$x^2 + 4x - 12 = (x + 6)(x - 2)$$

Label all of the numbers: $x^2 + bx + c = (x + m)(x + n)$. How are m and n related to b and c ?

****We use this sum and product relationship to factor simple trinomials.**

1. Factor. $x^2 + 8x + 12$: S: _____
P: _____

Practice: Factor.

a) $x^2 + 13x + 12$

S: _____

P: _____

b) $a^2 + 16a + 64$ S: _____
P: _____

*c) $2y^2 + 20y + 48$

*d) $-3a^2 - 51a - 216$

2. Factor. $x^2 - 11x + 10$:

Practice: Factor.

a) $a^2 - 11a + 30$

b) $y^2 - 10y + 25$

c) $x^2 - 11x + 28$

*d) $4a^2 - 48a + 80$

******HELPFUL HINT:** When the *product is a positive number*, both integers have the same sign!!!!

3. Factor: $x^2 - 2x - 24$

$x^2 + 2x - 24$

Practice: Factor.

a) $y^2 - 3y - 54$

b) $y^2 + 3y - 40$

c) $x^2 + 7x - 30$

d) $x^2 - 4x - 32$

*e) $5x^2 - 5x - 60$

******HELPFUL HINT:** When the *product is a negative number*, the integers have opposite signs!!!!

Problem Solving:

1. The expression $x^2 - 4x - 45$ cm² can be written in the form $(x - a)(x + b)$. The value of $a + b$ is _____.

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2.

When factored, the trinomials $x^2 - 10x + 21$ and $x^2 - 4x - 21$ have one binomial factor in common. This factor is

A. $x - 7$

B. $x + 7$

C. $x - 3$

D. $x + 3$

3. Find all possible integers for k so that each trinomial can be factored.

a) $x^2 + kx + 20$

b) $x^2 + kx - 8$