Factorisation - Lesson 9

Factorising Quadratic Trinomials (+, −, +)

LI

- Factorise expressions of the form $ax^2 + bx + c$.

SC

- Factorise, + and − numbers.

Jan 10-12:11

A Quadratic Trinomial is an expression of the form :

$$ax^2 + bx + c$$

quadratic (x^2) term x term constant term

with none of a, b and c equal to 0

Want to write this as :

$$(\quad - \quad)(\quad - \quad)$$

Reminders

$$-\text{ve} \times -\text{ve} = +\text{ve}$$

$$-\text{ve} + -\text{ve} = -\text{ve}$$

Example 1

Factorise $x^2 - 3x + 2$.

Find two numbers that :

- multiply to give $+2$.
- add to give -3.

$$x^2 - 3x + 2 = (x - 1)(x - 2)$$

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Example 2

Factorise $x^2 - 6x + 8$.

Find two numbers that :

- multiply to give $+8$.
- add to give -6.

$$x^2 - 6x + 8 = (x - 2)(x - 4)$$

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Example 3

Factorise $2x^2 - 11x + 12$.

$12 = 1 \times 12$

$12 = 2 \times 6$

$12 = 3 \times 4$

Try possibilities :

$(2x - \quad)(x - \quad)$

$(2x - \quad)(x - \quad)$

$(2x - \quad)(x - \quad)$

$(2x - \quad)(x - \quad)$

$(2x - \quad)(x - \quad)$

$(2x - \quad)(x - \quad)$

$$\boxed{2x^2 - 11x + 12 = (2x - 3)(x - 4)}$$

Factorise these quadratic trinomials :

1) $x^2 - 5x + 6$

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

3) $x^2 - 9x + 20$

4) $x^2 - 15x + 56$

5) $2x^2 - 11x + 15$

6) $3x^2 - 23x + 14$

7) $4x^2 - 13x + 10$

8) $4x^2 - 24x + 27$

Answers

1) $x^2 - 5x + 6$ $(x - 2)(x - 3)$

2) $x^2 - 11x + 30$ $(x - 5)(x - 6)$

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

4) $x^2 - 15x + 56$ $(x - 7)(x - 8)$

5) $2x^2 - 11x + 15$ $(2x - 5)(x - 3)$

6) $3x^2 - 23x + 14$ $(3x - 2)(x - 7)$

7) $4x^2 - 13x + 10$ $(4x - 5)(x - 2)$

8) $4x^2 - 24x + 27$ $(2x - 3)(2x - 9)$