Factoring Monic Quadratics

Today we focus only on the factors.

1. Both Factors Positive

Positive constant → same-sign factors. Linear term positive → both factors positive.

a)

$x^2 + 3x + 2 = 0$ $(x+1)(x+2)$

b)

$x^2 + 5x + 6 = 0$ $(x+2)(x+3)$

c)

$x^2 + 6x + 5 = 0$ $(x+1)(x+5)$

d)

$x^2 + 7x + 12 = 0$ $(x+3)(x+4)$

e)

$x^2 + 11x + 28 = 0$ $(x+4)(x+7)$

f)

$x^2 + 14x + 45 = 0$ $(x+5)(x+9)$

2. Both Factors Negative

Positive constant → same-sign factors. Linear term negative → both factors negative.

a)

$x^2 - 3x + 2 = 0$ $(x-1)(x-2)$

b)

$x^2 - 6x + 5 = 0$ $(x-1)(x-5)$

c)

$x^2 - 9x + 14 = 0$ $(x-2)(x-7)$

d)

$x^2 - 7x + 12 = 0$ $(x-3)(x-4)$

e)

$x^2 - 11x + 24 = 0$ $(x-3)(x-8)$

f)

$x^2 - 11x + 30 = 0$ $(x-5)(x-6)$

3. **Mixed Signs (Positive Dominant)**
   Negative constant → mixed signs. Linear term positive → the positive factor dominates.

a)

$x^2 - 4x - 5 = 0$ $(x+1)(x-5)$

b)

$x^2 - 5x - 14 = 0$ $(x+2)(x-7)$

c)

$x^2 - 5x - 24 = 0$ $(x+3)(x-8)$

d)

$x^2 - 5x - 36 = 0$ $(x+4)(x-9)$

e)

$x^2 - 6x - 55 = 0$ $(x+5)(x-11)$

f)

$x^2 - 6x - 91 = 0$ $(x+7)(x-13)$

4. **Mixed Signs (Negative Dominant)**
   Negative constant → mixed signs. Linear term negative → the negative factor dominates.

a)

$x^2 + 4x - 5 = 0$ $(x+5)(x-1)$

b)

$x^2 + 6x - 7 = 0$ $(x+7)(x-1)$

c)

$x^2 + 6x - 16 = 0$ $(x+8)(x-2)$

d)

$x^2 + 6x - 27 = 0$ $(x+9)(x-3)$

e)

$x^2 + 7x - 44 = 0$ $(x+11)(x-4)$

f)

$x^2 + 8x - 65 = 0$ $(x+13)(x-5)$

5. **24 Mixed Jumbled Questions**

A full mix of all four sign-patterns.

1)

$x^2 - 1x - 2 = 0$ $(x+1)(x-2)$

2)

$x^2 + 2x - 3 = 0$ $(x+3)(x-1)$

3)

$x^2 - 12x + 35 = 0$ $(x-5)(x-7)$

4)

$x^2 - 6x - 55 = 0$ $(x+5)(x-11)$

5)

$x^2 - 14x + 13 = 0$ $(x-1)(x-13)$

6)

$x^2 + 6x - 7 = 0$ $(x+7)(x-1)$

7)

$x^2 - 14x + 33 = 0$ $(x-3)(x-11)$

8)

$x^2 + 9x - 22 = 0$

$(x + 11)(x - 2)$

9)

$x^2 - 12x - 13 = 0$

$(x + 1)(x - 13)$

10)

$x^2 - 7x + 10 = 0$

$(x - 2)(x - 5)$

11)

$x^2 - 4x - 21 = 0$

$(x + 3)(x - 7)$

12)

$x^2 + 3x - 10 = 0$

$(x + 5)(x - 2)$

13)

$x^2 - 16x + 55 = 0$

$(x - 5)(x - 11)$

14)

$x^2 + 4x - 21 = 0$

$(x + 7)(x - 3)$

15)

$x^2 - 8x + 7 = 0$

$(x - 1)(x - 7)$

16)

$x^2 + 6x - 55 = 0$

$(x + 11)(x - 5)$

17)

$x^2 + 12x - 13 = 0$

$(x + 13)(x - 1)$

18)

$x^2 - 16x + 39 = 0$

$(x - 3)(x - 13)$

19)

$x^2 - 9x - 22 = 0$

$(x + 2)(x - 11)$

20)

$x^2 - 18x + 77 = 0$

$(x - 7)(x - 11)$

21)

$x^2 + 4x - 5 = 0$ $(x + 5)(x - 1)$

22)

$x^2 - 2x - 15 = 0$ $(x + 3)(x - 5)$

23)

$x^2 - 15x + 26 = 0$ $(x - 2)(x - 13)$

24)

$x^2 + 5x - 14 = 0$ $(x + 7)(x - 2)$