

## Solving Monic Quadratics

Factor, set each bracket to zero, and solve.

### 1. Negative–Negative Roots

a)  $x^2 + 3x + 2 = 0$

$$(x-1)(x-2) \implies x = -1, x = -2$$

b)  $x^2 + 6x + 5 = 0$

$$(x-1)(x-5) \implies x = -1, x = -5$$

c)  $x^2 + 8x + 7 = 0$

$$(x-1)(x-7) \implies x = -1, x = -7$$

d)  $x^2 + 5x + 6 = 0$

$$(x-2)(x-3) \implies x = -2, x = -3$$

e)  $x^2 + 8x + 15 = 0$

$$(x-3)(x-5) \implies x = -3, x = -5$$

f)  $x^2 + 12x + 35 = 0$

$$(x-5)(x-7) \implies x = -5, x = -7$$

g)  $x^2 + 18x + 77 = 0$

$$(x-7)(x-11) \implies x = -7, x = -11$$

h)  $x^2 + 24x + 143 = 0$

$$(x-11)(x-13) \implies x = -11, x = -13$$

i)  $x^2 + 15x + 26 = 0$

$$(x-2)(x-13) \implies x = -2, x = -13$$

### 2. Positive–Positive Roots

a)  $x^2 - 3x + 2 = 0$

$$(x-1)(x-2) \implies x = 1, x = 2$$

b)  $x^2 - 6x + 5 = 0$

$$(x-1)(x-5) \implies x = 1, x = 5$$

c)  $x^2 - 12x + 11 = 0$

$$(x-1)(x-11) \implies x = 1, x = 11$$

d)  $x^2 - 5x + 6 = 0$

$$(x-2)(x-3) \implies x = 2, x = 3$$

e)  $x^2 - 8x + 15 = 0$

$$(x-3)(x-5) \implies x = 3, x = 5$$

f)  $x^2 - 12x + 35 = 0$

$$(x-5)(x-7) \implies x = 5, x = 7$$

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

$$(x-7)(x-11) \implies x = 7, x = 11$$

h)  $x^2 - 24x + 143 = 0$

$$(x-11)(x-13) \implies x = 11, x = 13$$

i)  $x^2 - 15x + 26 = 0$

$$(x-2)(x-13) \implies x = 2, x = 13$$

### 3. Mixed Roots (Negative Dominant)

**a)**  $x^2 + 2x - 3 = 0$

$$(x-3)(x-1) \implies x = -3, x = 1$$

**b)**  $x^2 + 4x - 5 = 0$

$$(x-5)(x-1) \implies x = -5, x = 1$$

**c)**  $x^2 + 6x - 7 = 0$

$$(x-7)(x-1) \implies x = -7, x = 1$$

**d)**  $x^2 + 3x - 10 = 0$

$$(x-5)(x-2) \implies x = -5, x = 2$$

**e)**  $x^2 + 4x - 21 = 0$

$$(x-7)(x-3) \implies x = -7, x = 3$$

**f)**  $x^2 + 9x - 22 = 0$

$$(x-11)(x-2) \implies x = -11, x = 2$$

**g)**  $x^2 + 10x - 39 = 0$

$$(x-13)(x-3) \implies x = -13, x = 3$$

**h)**  $x^2 + 6x - 55 = 0$

$$(x-11)(x-5) \implies x = -11, x = 5$$

**i)**  $x^2 + 8x - 65 = 0$

$$(x-13)(x-5) \implies x = -13, x = 5$$

#### 4. Mixed Roots (Positive Dominant)

**a)**  $x^2 - 4x - 5 = 0$

$$(x-1)(x-5) \implies x = -1, x = 5$$

**b)**  $x^2 - 6x - 7 = 0$

$$(x-1)(x-7) \implies x = -1, x = 7$$

**c)**  $x^2 - 10x - 11 = 0$

$$(x-1)(x-11) \implies x = -1, x = 11$$

**d)**  $x^2 - 3x - 10 = 0$

$$(x-2)(x-5) \implies x = -2, x = 5$$

**e)**  $x^2 - 4x - 21 = 0$

$$(x-3)(x-7) \implies x = -3, x = 7$$

**f)**  $x^2 - 6x - 55 = 0$

$$(x-5)(x-11) \implies x = -5, x = 11$$

**g)**  $x^2 - 10x - 39 = 0$

$$(x-3)(x-13) \implies x = -3, x = 13$$

**h)**  $x^2 - 11x - 26 = 0$

$$(x-2)(x-13) \implies x = -2, x = 13$$

**i)**  $x^2 - 2x - 35 = 0$

$$(x-5)(x-7) \implies x = -5, x = 7$$