Quadratic Equations

Consider $(x+a)(x+b)$

$$= x^2 + ax + bx + ab$$

$$= x^2 + (a+b)x + ab$$

Factorising is the reverse of this expansion process

Examples

1. $x^2 + 5x + 6 = (x+2)(x+3)$

$+1 \quad +6$
$-1 \quad -6$
$+2 \quad +3$ ✓
$-2 \quad -3$

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

$+1 \quad +24$
$+2 \quad +12$
$+3 \quad +8$ ✓

3. $x^2 - 7x + 10 = (x-2)(x-5)$

$+1 \quad +10$
$-1 \quad -10$
$+2 \quad +5$
$-2 \quad -5$ ✓

Exercise

1. $x^2 + 12x + 20 = (x+2)(x+10)$

$+1 \quad +20$
$+2 \quad +10$ ✓

2. $x^2 - 8x + 7 = (x-1)(x-7)$

$+1 \quad +7$
$-1 \quad -7$

Examples

4. $x^2 - 3x - 10 = (x+2)(x-5)$

$+1 \quad -10$
$-1 \quad +10$
$+2 \quad -5$ ✓
$-2 \quad +5$

5. $x^2 + x - 12 = (x-3)(x+4)$

$+1 \quad -12$
$-1 \quad +12$
$+2 \quad -6$
$-2 \quad +6$
$+3 \quad -4$
$-3 \quad +4$ ✓

Exercise

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

$+1 \quad -24$
$+2 \quad -12$
$+3 \quad -8$

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

$+1 \quad -14$
$-1 \quad +14$
$+2 \quad -7$
$-2 \quad +7$ ✓

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

$+1 \quad -2$ ✓
$-1 \quad +2$

Solving Quadratic Equations

Examples

1. $x^2 + 5x + 6 = 0$

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

Either $x + 2 = 0$ or $x + 3 = 0$

$\underline{x = -2}$ $\quad$ $\underline{x = -3}$

2. $x^2 - x - 2 = 0$

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

Either $x + 1 = 0$ or $x - 2 = 0$

$\underline{x = -1}$ $\quad$ $\underline{x = 2}$