

Factorising Quadratic Expressions

Ex 1

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

+1	+8
-1	-8
+2	+4 ✓
-2	-4

Ex 2

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

+1	+24
-1	-24
+2	+12
-2	-12
+3	+8 ✓
-3	-8
+4	+6
-4	-6

Ex 3

$$x^2 + 51x + 50 = (x + 1)(x + 50)$$

+1	+50 ✓
-1	-50
+2	+25
-2	-25
+5	+10
-5	-10

Exercice Factorielle

1)

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

+1	+14
-1	-14
+2	+7 ✓
-2	-7

2)

$$x^2 + 10x + 21 = (x + 3)(x + 7)$$

+1	+21
-1	-21
+3	+7 ✓
-3	-7

$$3) \quad x^2 + 10x + 25 = (x + 5)(x + 5)$$

+	1	+	25
-	1	-	25
+	5	+	5 ✓
-	5	-	5

$$4) \quad x^2 + 2x + 1 = (x + 1)(x + 1)$$

+	1	+	1 ✓
-	1	-	1

$$5) \quad x^2 + 7x + 6 = (x + 1)(x + 6)$$

+	1	+	6 ✓
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Further Examples

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

+	1	+	4
-	1	-	4 ✓
+	2	+	2
-	2	-	2

$$2) \quad x^2 + 4x - 21 = (x - 3)(x + 7)$$

+	1	-	21
-	1	+	21
+	3	-	7
-	3	+	7 ✓

$$3) \quad x^2 - x - 20 = (x + 4)(x - 5)$$

+	1	-	20
-	1	+	20
+	2	-	10
-	2	+	10

$$\begin{array}{r} +4 \quad -5 \checkmark \\ -4 \quad +5 \end{array}$$

Exercise Factorise

$$\begin{array}{l} 1) \quad x^2 - 8x + 7 \\ = (x - 1)(x - 7) \end{array} \quad \begin{array}{r} +1 \quad +7 \\ -1 \quad -7 \checkmark \end{array}$$

$$\begin{array}{l} 2) \quad x^2 - 11x + 10 \\ = (x - 1)(x - 10) \end{array} \quad \begin{array}{r} +1 \quad +10 \\ -1 \quad -10 \checkmark \end{array}$$

$$\begin{array}{l} 3) \quad x^2 + 3x - 10 \\ = (x - 2)(x + 5) \end{array} \quad \begin{array}{r} +1 \quad -10 \\ -1 \quad +10 \\ +2 \quad -5 \\ -2 \quad +5 \checkmark \end{array}$$

$$\begin{array}{l} 4) \quad x^2 - 7x - 8 \\ = (x + 1)(x - 8) \end{array} \quad \begin{array}{r} +1 \quad -8 \checkmark \end{array}$$

$$\begin{array}{l} 5) \quad x^2 + 13x - 14 \\ = (x - 1)(x + 14) \end{array} \quad \begin{array}{r} +1 \quad -14 \\ -1 \quad +14 \checkmark \end{array}$$

$$\begin{array}{l} 6) \quad x^2 - 10x - 11 \\ = (x + 1)(x - 11) \end{array} \quad \begin{array}{r} +1 \quad -11 \checkmark \\ -1 \quad +11 \end{array}$$

$$7) \quad x^2 + 8x - 9 \quad \begin{array}{l} +1 \quad -9 \\ -1 \quad +9 \checkmark \end{array}$$

$$= (x-1)(x+9)$$

$$8) \quad x^2 + 2x - 15 \quad \begin{array}{l} +1 \quad -15 \\ -1 \quad +15 \\ +3 \quad -5 \\ -3 \quad +5 \checkmark \end{array}$$

$$= (x-3)(x+5)$$

$$9) \quad x^2 - 7x + 12 \quad \begin{array}{l} +1 \quad +12 \\ -1 \quad -12 \\ +2 \quad +6 \\ -2 \quad -6 \\ +3 \quad +4 \\ -3 \quad -4 \checkmark \end{array}$$

$$= (x-3)(x-4)$$

$$10) \quad x^2 - 4x + 4 \quad \begin{array}{l} +1 \quad +4 \\ -1 \quad -4 \\ +2 \quad +2 \\ -2 \quad -2 \checkmark \end{array}$$

$$= (x-2)(x-2)$$

Solving Quadratic Equations.

$$\text{Ex 1} \quad x^2 - 7x - 8 = 0 \quad \begin{array}{l} +1 \quad -8 \checkmark \\ -1 \quad +8 \end{array}$$

$$(x+1)(x-8) = 0$$

$$\text{Either} \quad x+1=0 \quad \text{or} \quad x-8=0$$

$$\underline{x=-1} \quad \underline{x=8}$$

Ex 2

$$x^2 - 2x - 24 = 0$$

$$(x + 4)(x - 6) = 0$$

$$\begin{array}{ll} +1 & -24 \\ -1 & +24 \\ +4 & -6 \checkmark \\ -4 & +6 \end{array}$$

Either $x + 4 = 0$ or $x - 6 = 0$

$$\underline{x = -4}$$

$$\underline{x = 6}$$

Exercise

1)

$$x^2 - 3x - 18 = 0$$

$$(x + 3)(x - 6) = 0$$

$$\begin{array}{ll} +1 & -18 \\ -1 & +18 \\ +3 & -6 \checkmark \\ -3 & +6 \end{array}$$

Either $x + 3 = 0$ or $x - 6 = 0$

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

$$\underline{x = 6}$$