

Factorising Quadratic Expressions

$$\begin{aligned}\text{Consider } & (x+a)(x+b) \\ &= x^2 + ax + bx + ab \\ &= x^2 + (a+b)x + ab\end{aligned}$$

Factorising is the reverse of this expanding process

$$\begin{aligned}\text{Ex1} \quad & x^2 + 5x + 6 \\ &= (x+2)(x+3)\end{aligned}$$

+1	+6
-1	-6
+2	+3 ✓
-2	-3

$$\begin{aligned}\text{Ex2} \quad & x^2 - 11x + 24 \\ &= (x-3)(x-8)\end{aligned}$$

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

$$\begin{aligned}\text{Ex3} \quad & x^2 + 3x - 10 \\ &= (x-2)(x+5)\end{aligned}$$

+1	-10
-1	+10
+2	-5
-2	+5 ✓

$$\begin{aligned}\text{Ex4} \quad & x^2 - 7x - 18 \\ &= (x+2)(x-9)\end{aligned}$$

+1	-18
-1	+18
+2	-9 ✓
-2	+9
+3	-6
-3	+6

$$\begin{aligned} \text{Ex 5} \quad & x^2 - x - 20 \\ & = (x + 4)(x - 5) \end{aligned}$$

$$\begin{array}{ll} +1 & -20 \\ -1 & +20 \\ +2 & -10 \\ -2 & +10 \\ +4 & -5 \checkmark \\ -4 & +5 \end{array}$$

Homework

Factorise

1 $x^2 + 11x + 18 =$

2 $x^2 - 6x + 8 =$

3 $x^2 + x - 12 =$

4 $x^2 - 3x - 10 =$

5 $x^2 + 10x + 24 =$

6 $x^2 - 2x + 1 =$

7 $x^2 + 8x - 20 =$

8 $x^2 - 14x - 15 =$

9 $x^2 + 9x + 14 =$

10 $x^2 - 21x - 100 =$