Factorising into Single Brackets

Mathematicards *Grade 4–6*

PRO TIP: Highest Common Factor

Factorising is the inverse of expanding. Look for the **Highest Common Factor (HCF)** of all terms and place it outside the bracket.

- $6x + 9 = 3(2x + 3)$
- Check your answer by expanding the bracket back out!

Section 1: The Essentials (Grade 4–5)

Factorise these expressions completely by finding the common numerical factor.

1. $2x + 10$ 2(x + 5)
2. $5y - 15$ 5(y - 3)
3. $12a + 8$ 4(3a + 2)
4. $21b - 14$ 7(3b - 2)
5. $10x + 25$ 5(2x + 5)
6. $18y - 27$ 9(2y - 3)
7. $4a + 20$ 4(a + 5)
8. $30b - 45$ 15(2b - 3)

KEY PATTERN: Algebraic Factors

Don't forget to look for letters that are common to all terms. If x appears in every term, it must go outside the bracket.

- $x^2 + 5x = x(x + 5)$
- $6x^2 - 4x = 2x(3x - 2)$

Section 2: More Challenging (Grade 5–6)

Factorise fully. These involve both numbers and letters.

9. $x^2 + 7x$ x(x + 7)
10. $y^2 - 4y$ y(y - 4)
11. $3a^2 + 6a$ 3a(a + 2)
12. $5b^2 - 10b$ 5b(b - 2)
13. $8x^2 + 12x$ 4x(2x + 3)
14. $15y^2 - 10y$ 5y(3y - 2)
15. $x^2y + xy^2$ xy(x + y)
16. $4ab - 6ac$ 2a(2b - 3c)

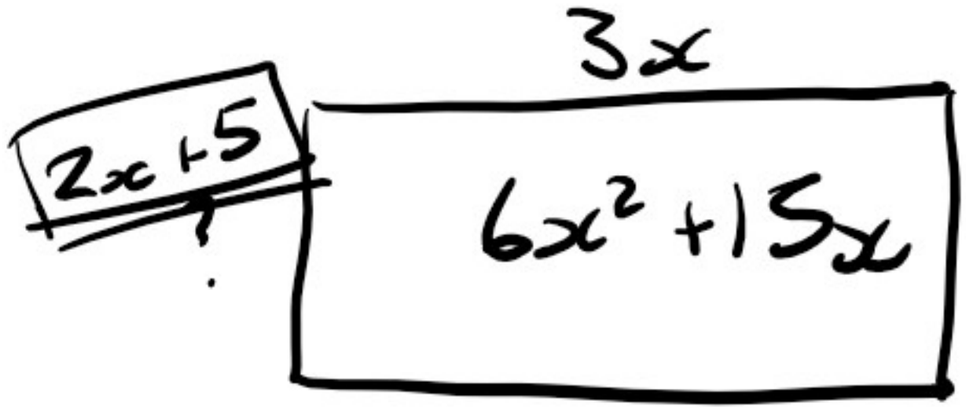
Section 3: Challenge Problems

17. Factorise completely: $12x^3 - 18x^2$ $6x^2(2x-3)$

18. Factorise fully: $4\pi r^2 + 2\pi rh$ $2\pi r(2r+h)$

19. Factorise: $10a^2b - 15ab^2 + 5ab$ $5ab(2a-3b+1)$

20. The area of a rectangle is given by $6x^2 + 15x$. Find the width if the length is $3x$.



$3x(2x+5) = 6x^2+15x$