

نشر و تبسيط

قواعد

$$k(a + b) = ka + kb$$

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

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

$$(a + b)(a - b) = a^2 - b^2$$

أمثلة

$$\begin{aligned} (x+1)^2 + (2x+3)^2 &= x^2 + 2x + 1 + (2x)^2 + 2 \times 2x \times 3 + 3^2 \\ &= x^2 + 4x^2 + 2x + 12x + 1 + 9 \\ &= 5x^2 + 14x + 10 \end{aligned}$$

$$\begin{aligned} (3x+5)(x-4) - (7x+2)^2 &= (3x^2 - 12x + 5x - 20) - (49x^2 + 28x + 4) \\ &= 3x^2 - 7x - 20 - 49x^2 - 28x - 4 \\ &= 3x^2 - 49x^2 - 7x - 28x - 20 - 4 \\ &= -38x^2 - 35x - 24 \end{aligned}$$

تمرين

1. $(x+3)^2 + (3x+4)^2 =$
2. $(x+4)^2 + (5x-3)^2 =$
3. $(10x-15)^2 + (5+8x)^2 =$
4. $(5+2x)(3x+6) + (x-7)^2 =$
5. $(2x-4)(8x-7) + (9-3x)^2 =$
6. $(3-x)(7x-5) - (8x-3)^2 =$
7. $(12x-11)^2 - (3-13x)^2 =$
8. $(3-5x)^2 - (5-x)(3x+4) =$
9. $(3x+2)(6x-4) - (5x-3)(5x+3) =$
10. $(6x+5)(6x-5) - (3x+2)^2 =$

حلول

$$\begin{aligned} 1. \quad (x+3)^2 + (3x+4)^2 &= (x^2 + 6x + 9) + (9x^2 + 24x + 16) \\ &= x^2 + 6x + 9 + 9x^2 + 24x + 16 \\ &= 10x^2 + 30x + 25 \end{aligned}$$

$$\begin{aligned} 2. \quad (x+4)^2 + (5x-3)^2 &= (x^2 + 8x + 16) + (25x^2 - 30x + 9) \\ &= 26x^2 - 22x + 25 \end{aligned}$$

$$\begin{aligned} 3. \quad (10x-15)^2 + (5+8x)^2 &= (100x^2 - 300x + 225) + (25 + 80x + 64x^2) \\ &= 164x^2 - 220x + 250 \end{aligned}$$

$$\begin{aligned} 4. \quad (5+2x)(3x+6) + (x-7)^2 &= (15x + 30 + 6x^2 + 12x) + (x^2 - 14x + 49) \\ &= 7x^2 + 13x + 79 \end{aligned}$$

$$\begin{aligned} 5. \quad (2x-4)(8x-7) + (9-3x)^2 &= (16x^2 - 14x - 32x + 28) + (81 - 54x + 9x^2) \\ &= 25x^2 - 100x + 109 \end{aligned}$$

$$\begin{aligned} 6. \quad (3-x)(7x-5) - (8x-3)^2 &= (21x - 15 - 7x^2 + 5x) - (64x^2 - 48x + 9) \\ &= 26x - 15 - 7x^2 - 64x^2 + 48x - 9 \\ &= -71x^2 + 74x - 24 \end{aligned}$$

$$\begin{aligned} 7. \quad (12x-11)^2 - (3-13x)^2 &= (144x^2 - 164x + 121) - (9 - 78x + 169x^2) \\ &= 144x^2 - 164x + 121 - 9 + 78x - 169x^2 \\ &= -25x^2 - 86x + 113 \end{aligned}$$

$$\begin{aligned} 8. \quad (3-5x)^2 - (5-x)(3x+4) &= (9 - 30x + 25x^2) - (15x + 20 - 3x^2 - 4x) \\ &= 9 - 30x + 25x^2 - 11x - 20 + 3x^2 \\ &= 28x^2 - 41x - 11 \end{aligned}$$

$$\begin{aligned} 9. \quad (3x+2)(6x-4) - (5x-3)(5x+3) &= (18x^2 - 12x + 12x - 8) - (5x^2 - 9) \\ &= 18x^2 - 8 - 5x^2 + 9 \\ &= 13x^2 + 1 \end{aligned}$$

$$\begin{aligned} 10. \quad (6x+5)(6x-5) - (3x+2)^2 &= (36x^2 - 25) - (9x^2 + 12x + 4) \\ &= 36x^2 - 25 - 9x^2 - 12x - 4 \\ &= 27x^2 - 12x - 29 \end{aligned}$$