

Auto-évaluation 1 page 151

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Maths 2de



Développer et réduire les expressions suivantes.

1 $(x + 1)^2$

2 $(x - 3)^2$

3 $(x - 1,5)^2 - 2,5$

4 $\left(x - \frac{1}{3}\right)^2 - \frac{2}{3}$

5 $5(x - 1)(x - 4)$

6 $-2(x - 4)(x + 2)$

7 $7(x + 7)(x + 3)$

8 $-\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right)$

1 $(x + 1)^2$

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On reconnaît une expression de la forme $(a + b)^2$.

On sait que la forme développée est $a^2 + 2ab + b^2$.

Ici, a vaut x et b vaut 1.

1 $(x + 1)^2$

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

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

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

$$2 \quad (x - 3)^2$$

2 $(x - 3)^2$

On reconnaît une expression de la forme $(a - b)^2$.

On sait que la forme développée est $a^2 - 2ab + b^2$.

Ici, a vaut x et b vaut 3 .

$$2 \quad (x - 3)^2$$

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

$$2 \quad (x - 3)^2$$

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

$$(x - 3)^2 = x^2 - 6x + 9$$

3 $(x - 1,5)^2 - 2,5$

3 $(x - 1,5)^2 - 2,5$

$$(x - 1,5)^2 - 2,5 = x^2 - 2(x)(1,5) + (1,5)^2 - 2,5$$

$$\mathbf{3} \quad (x - 1,5)^2 - 2,5$$

$$(x - 1,5)^2 - 2,5 = x^2 - 2(x)(1,5) + (1,5)^2 - 2,5$$

$$(x - 1,5)^2 - 2,5 = x^2 - 3x + 2,25 - 2,5$$

$$\mathbf{3} \quad (x - 1,5)^2 - 2,5$$

$$(x - 1,5)^2 - 2,5 = x^2 - 2(x)(1,5) + (1,5)^2 - 2,5$$

$$(x - 1,5)^2 - 2,5 = x^2 - 3x + 2,25 - 2,5$$

$$(x - 1,5)^2 - 2,5 = x^2 - 3x - 0,25$$

$$4 \left(x - \frac{1}{3}\right)^2 - \frac{2}{3}$$

$$\begin{aligned} 4 \quad & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} \\ & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} = x^2 - 2(x) \left(\frac{1}{3}\right) + \left(\frac{1}{3}\right)^2 - \frac{2}{3} \end{aligned}$$

$$\begin{aligned} 4 \quad & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} \\ & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} = x^2 - 2(x) \left(\frac{1}{3}\right) + \left(\frac{1}{3}\right)^2 - \frac{2}{3} \\ & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} = x^2 - \frac{2}{3}x + \frac{1}{9} - \frac{6}{9} \end{aligned}$$

$$\begin{aligned} 4 \quad & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} \\ & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} = x^2 - 2(x) \left(\frac{1}{3}\right) + \left(\frac{1}{3}\right)^2 - \frac{2}{3} \\ & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} = x^2 - \frac{2}{3}x + \frac{1}{9} - \frac{6}{9} \\ & \left(x - \frac{1}{3}\right)^2 - \frac{2}{3} = x^2 - \frac{2}{3}x - \frac{5}{9} \end{aligned}$$

5 $5(x - 1)(x - 4)$

5 $5(x - 1)(x - 4)$

On développe l'expression $(x - 1)(x - 4)$ en utilisant la double distributivité.

5 $5(x - 1)(x - 4)$

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

5 $5(x - 1)(x - 4)$

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

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

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On termine en tenant compte du facteur 5.

$$5(x - 1)(x - 4)$$

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

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

$$5(x - 1)(x - 4) = 5x^2 - 25x + 20$$

$$6 \quad -2(x - 4)(x + 2)$$

$$\begin{aligned} \mathbf{6} \quad & -2(x - 4)(x + 2) \\ & -2(x - 4)(x + 2) = -2(x^2 + 2x - 4x - 8) \end{aligned}$$

$$6 \quad -2(x - 4)(x + 2)$$

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

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

$$\mathbf{6} \quad -2(x - 4)(x + 2)$$

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

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

$$-2(x - 4)(x + 2) = -2x^2 + 4x + 16$$

7 $7(x + 7)(x + 3)$

$$7(x + 7)(x + 3)$$

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

$$7(x + 7)(x + 3)$$

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

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

$$7(x + 7)(x + 3)$$

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

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

$$7(x + 7)(x + 3) = 7x^2 + 70x + 147$$

$$8 \quad -\frac{1}{2} \left(x - \frac{1}{4} \right) \left(x - \frac{2}{5} \right)$$

$$\begin{aligned} 8 \quad & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) \\ & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) = -\frac{1}{2} \left(x^2 - \frac{2}{5}x - \frac{1}{4}x + \frac{1}{10}\right) \end{aligned}$$

$$\begin{aligned} 8 \quad & -\frac{1}{2} \left(x - \frac{1}{4} \right) \left(x - \frac{2}{5} \right) \\ & -\frac{1}{2} \left(x - \frac{1}{4} \right) \left(x - \frac{2}{5} \right) = -\frac{1}{2} \left(x^2 - \frac{2}{5}x - \frac{1}{4}x + \frac{1}{10} \right) \\ & -\frac{1}{2} \left(x - \frac{1}{4} \right) \left(x - \frac{2}{5} \right) = -\frac{1}{2} \left(x^2 - \frac{8}{20}x - \frac{5}{20}x + \frac{1}{10} \right) \end{aligned}$$

$$\begin{aligned} 8 \quad & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) \\ & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) = -\frac{1}{2} \left(x^2 - \frac{2}{5}x - \frac{1}{4}x + \frac{1}{10}\right) \\ & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) = -\frac{1}{2} \left(x^2 - \frac{8}{20}x - \frac{5}{20}x + \frac{1}{10}\right) \\ & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) = -\frac{1}{2} \left(x^2 - \frac{13}{20}x + \frac{1}{10}\right) \end{aligned}$$

$$\begin{aligned}
 \text{8} \quad & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) \\
 & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) = -\frac{1}{2} \left(x^2 - \frac{2}{5}x - \frac{1}{4}x + \frac{1}{10}\right) \\
 & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) = -\frac{1}{2} \left(x^2 - \frac{8}{20}x - \frac{5}{20}x + \frac{1}{10}\right) \\
 & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) = -\frac{1}{2} \left(x^2 - \frac{13}{20}x + \frac{1}{10}\right) \\
 & -\frac{1}{2} \left(x - \frac{1}{4}\right) \left(x - \frac{2}{5}\right) = -\frac{1}{2}x^2 + \frac{13}{40}x - \frac{1}{20}
 \end{aligned}$$