

H. Puissances et distributivité

Correctif

Limet Page 17 n°8

$$\begin{aligned} \textcircled{1} & \quad [2x(x+3)] + [4x(2x-1)] - [3x(5x+2)] \\ & = [2x \cdot x + 2x \cdot 3] + [4x \cdot 2x - 4x \cdot 1] - [3x \cdot 5x + 3x \cdot 2] \\ & = [2x^2 + 6x] + [8x^2 - 4x] - [15x^2 + 6x] \\ & = \underline{2x^2} + \underline{6x} + \underline{8x^2} - \underline{4x} - \underline{15x^2} - \underline{6x} \\ & = -5x^2 - 4x \end{aligned}$$

$$\begin{aligned} \textcircled{2} & \quad [(3a-2)(3a+1)] - [(5a-3)(2a+7)] \\ & = [3a \cdot 3a + 3a \cdot 1 - 2 \cdot 3a - 2 \cdot 1] - [5a \cdot 2a + 5a \cdot 7 - 3 \cdot 2a - 3 \cdot 7] \\ & = [9a^2 + 3a - 6a - 2] - [10a^2 + 35a - 6a - 21] \\ & = [9a^2 - 3a - 2] - [10a^2 + 29a - 21] \\ & = \underline{9a^2} - \underline{3a} - \underline{2} - \underline{10a^2} - \underline{29a} + \underline{21} \\ & = -a^2 - 32a + 19 \end{aligned}$$

$$\begin{aligned} \textcircled{3} & \quad [(3x-5)(2-3x)] + [(4x+1)(1-4x)] \\ & = [3x \cdot 2 - 3x \cdot 3x - 5 \cdot 2 + 15x] + [4x \cdot 1 - 4x \cdot 4x + 1 \cdot 1 - 4x] \\ & = [6x - 9x^2 - 10 + 15x] + [4x - 16x^2 + 1 - 4x] \\ & = [21x - 9x^2 - 10] + [-16x^2 + 1] \\ & = \underline{21x} - \underline{9x^2} - \underline{10} - \underline{16x^2} + \underline{1} \\ & = 21x - 25x^2 - 9 \end{aligned}$$

$$\begin{aligned} \textcircled{4} & \quad [4a(3a-1)] - [(2a+3)(3a+1)] + [a(2a-3)] \\ & = [4a \cdot 3a - 4a \cdot 1] - [2a \cdot 3a + 2a \cdot 1 + 3 \cdot 3a + 3 \cdot 1] + [a \cdot 2a - a \cdot 3] \\ & = [12a^2 - 4a] - [6a^2 + 2a + 9a + 3] + [2a^2 - 3a] \\ & = [12a^2 - 4a] - [6a^2 + 11a + 3] + [2a^2 - 3a] \\ & = \underline{12a^2} - \underline{4a} - \underline{6a^2} - \underline{11a} - \underline{3} + \underline{2a^2} - \underline{3a} \\ & = 8a^2 - 18a - 3 \end{aligned}$$

5) $[3(2x + 5y)(3x - y)] - [5(x - 4y)(3x + 4y)]$

$$= [3(2x \cdot 3x - 2x \cdot y + 5y \cdot 3x - 5y \cdot y)] - [5(x \cdot 3x + x \cdot 4y - 4y \cdot 3x - 4y \cdot 4y)]$$

$$= [3(6x^2 - 2xy + 15xy - 5y^2)] - [5(3x^2 + 4xy - 12xy - 16y^2)]$$

$$= [3(6x^2 + 13xy - 5y^2)] - [5(3x^2 - 8xy - 16y^2)]$$

$$= [3 \cdot 6x^2 + 3 \cdot 13xy - 3 \cdot 5y^2] - [5 \cdot 3x^2 - 5 \cdot 8xy - 5 \cdot 16y^2]$$

$$= [18x^2 + 39xy - 15y^2] - [15x^2 - 40xy - 80y^2]$$

$$= \underline{18x^2} + \underline{39xy} - 15y^2 - \underline{15x^2} - \underline{40xy} + \underline{80y^2}$$

$$= 3x^2 + 49xy + 65y^2$$

6) $[(x-1)(x-2)(x-3)] - [(x+1)(x+2)(x+3)]$

distribuer

$$= [(x \cdot x - x \cdot 2 - x + 2)(x - 3)] - [(x \cdot x + 2x + x + 2)(x + 3)]$$

avant de distribuer une seconde fois, réduire les termes semblables afin de diminuer le nombre de termes

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

on distribue

$$= [x^2 \cdot x - x^2 \cdot 3 - 3x \cdot x + 3x \cdot 3 + 2x - 2 \cdot 3] - [x^2 \cdot x + x^2 \cdot 3 + 3x \cdot x + 3x \cdot 3 + 2x + 2 \cdot 3]$$

$$= [x^3 - 3x^2 - 3x^2 + 9x + 2x - 6] - [x^3 + 3x^2 + 3x^2 + 9x + 2x + 6]$$

réduire les termes semblables

$$= [x^3 - 6x^2 + 11x - 6] - [x^3 + 6x^2 + 11x + 6]$$

appliquer la règle de suppression des parenthèses

$$= \cancel{x^3} - 6x^2 + \cancel{11x} - 6 - \cancel{x^3} - 6x^2 - \cancel{11x} - 6$$

$$= -12x^2 - 12$$

7) $[2(x+1)(x-1)] - [3(x+2)(x-2)]$

$$= [2(x^2 - 1)] - [3(x^2 - 4)]$$

$$= [2(x^2 - 1)] - [3(x^2 - 4)]$$

$$= [2x^2 - 2] - [3x^2 - 12]$$

$$= 2x^2 - 2 - 3x^2 + 12$$

$$= -x^2 + 10$$

Correctif

$$\begin{aligned} \textcircled{8} \quad & [(x-1)(x+1)] + [(x+2)(x-2)] - [(x+3)(x-3)] \\ & = [x^2 - 1] + [x^2 - 4] - [x^2 - 9] \\ & = x^2 - 1 + \cancel{x^2} - 4 - \cancel{x^2} + 9 \\ & = x^2 + 4 \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad & [(x+1)(x-1)(x+2)] - [(x+2)(x-2)(x-3)] \\ & = [(x^2 - x + x - 1)(x+2)] - [(x^2 - 2x + 2x - 4)(x-3)] \\ & = [(x^2 - 1)(x+2)] - [(x^2 - 4)(x-3)] \\ & = [x^2 \cdot x + x^2 \cdot 2 - x - 2] - [x^2 \cdot x - 3x^2 - 4x + 12] \\ & = [x^3 + 2x^2 - x - 2] - [x^3 - 3x^2 - 4x + 12] \\ & = \underline{x^3} + \underline{2x^2} - \underline{x} - \underline{2} - \underline{x^3} + \underline{3x^2} + \underline{4x} - \underline{12} \\ & = 5x^2 + 3x - 14 \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad & 3(x-1)(x+2) - 2(x+1)(x-2) + 3(x+2)(x-2) \\ & = [3(x^2 + 2x - x - 2)] - [2(x^2 - 2x + x - 2)] + [3(x^2 - 2x + 2x - 4)] \\ & = [3(x^2 + x - 2)] - [2(x^2 - x - 2)] + [3(x^2 - 4)] \\ & = [3x^2 + 3x - 6] - [2x^2 - 2x - 4] + [3x^2 - 12] \\ & = \underline{3x^2} + \underline{3x} - \underline{6} - \underline{2x^2} + \underline{2x} + \underline{4} + \underline{3x^2} - \underline{12} \\ & = 4x^2 + 5x - 14 \end{aligned}$$