

Correction du DL2

Niveau 1

1. $2(x + 7) = 2x + 14.$
2. $-(x - 4) = -x + 4.$
3. $(x + 2)(x - 3) = x^2 - 3x + 2x - 6 = x^2 - x - 6.$
4. $(2x - 1)(x - 5) = 2x^2 - 10x - x + 5 = 2x^2 - 11x + 5.$
5. $5x + 30 = 5(x + 6).$
6. $x^2 - 6x = x(x - 6).$
7. $4x(x - 1) + 3(x - 1) = (4x + 3)(x - 1).$
- 8.

$$\begin{aligned}
 (x + 3)(2x - 1) - (x + 3)(5x + 2) &= (x + 3)[(2x - 1) - (5x + 2)] \\
 &= (x + 3)[2x - 1 - 5x - 2] \\
 &= (x + 3)(-3x - 3) \\
 &= -3(x + 3)(x + 1).
 \end{aligned}$$

9. $(2x + 3)^2 = 4x^2 + 12x + 9.$
10. $(x - 9)^2 = x^2 - 18x + 81.$
11. $(4x + 5)(4x - 5) = 16x^2 - 25.$
12. $x^2 + 14x + 49 = (x + 7)^2.$
13. $9x^2 - 12x + 4 = (3x - 2)^2.$
14. $x^2 - 4 = (x + 2)(x - 2).$
- 15.

$$\begin{aligned}
 \frac{3}{x - 2} - \frac{2}{x + 4} &= \frac{3(x + 4)}{(x - 2)(x + 4)} - \frac{2(x - 2)}{(x + 4)(x - 2)} \\
 &= \frac{3(x + 4) - 2(x - 2)}{(x - 2)(x + 4)} \\
 &= \frac{3x + 12 - 2x + 4}{(x - 2)(x + 4)} \\
 &= \frac{x + 16}{(x - 2)(x + 4)}.
 \end{aligned}$$

Niveau 2

16. $\frac{5}{2}(x - 6) = \frac{5}{2}x - 15.$
17. $4 - 3(-x + 1) = 4 + 3x - 3 = 3x + 1.$
18. $(x - 2)\left(-x + \frac{1}{2}\right) = -x^2 + \frac{1}{2}x + 2x - 1 = -x^2 + \frac{5}{2}x - 1.$
19. $(x - \sqrt{2})(x - \sqrt{5}) = x^2 - \sqrt{5}x - \sqrt{2}x + \sqrt{10} = x^2 - (\sqrt{5} + \sqrt{2})x + \sqrt{10}.$
20. $x^3 + 7x^2 - 4x = x(x^2 + 7x - 4).$
21. $6x^3 - 3x^2 = 3x^2(2x - 1).$
- 22.

$$\begin{aligned}
 (3x - 1)^2 - (x + 4)(3x - 1) &= (3x - 1)(3x - 1) - (x + 4)(3x - 1) \\
 &= (3x - 1)[(3x - 1) - (x + 4)] \\
 &= (3x - 1)[3x - 1 - x - 4] \\
 &= (3x - 1)(2x - 5).
 \end{aligned}$$

- 23.

$$\begin{aligned}
 (x-2)(8x+4) - (2x+1)(x-2) &= (x-2)[(8x+4) - (2x+1)] \\
 &= (x-2)[8x+4-2x-1] \\
 &= (x-2)(6x+3) \\
 &= 3(x-2)(2x+1).
 \end{aligned}$$

24. $(5x+6)^2 = 25x^2 + 60x + 36.$

25. $\left(x - \frac{5}{2}\right)^2 = x^2 - 5x + \frac{25}{4}.$

26. $(x - \sqrt{7})(x + \sqrt{7}) = x^2 - 7.$

27. $36x^2 + 12x + 1 = (6x+1)^2.$

28. $x^2 - \frac{4}{3}x + \frac{4}{9} = \left(x - \frac{2}{3}\right)^2.$

29. $x^2 - 3 = (x + \sqrt{3})(x - \sqrt{3}).$

30.

$$\begin{aligned}
 4 - \frac{2x+1}{x-3} &= \frac{4}{1} - \frac{2x+1}{x-3} \\
 &= \frac{4 \times (x-3)}{1 \times (x-3)} - \frac{2x+1}{x-3} \\
 &= \frac{4(x-3)}{x-3} - \frac{2x+1}{x-3} \\
 &= \frac{4(x-3) - (2x+1)}{x-3} \\
 &= \frac{4x - 12 - 2x - 1}{x-3} \\
 &= \frac{2x - 13}{x-3}.
 \end{aligned}$$

Niveau 3

31. $\frac{2}{3}(9x-4) - \frac{1}{6}(2-x) = 6x - \frac{8}{3} - \frac{1}{3} + \frac{1}{6}x = \frac{37}{6}x - 3.$

32.

$$\begin{aligned}
 2x(x^2 + x - 1) - (x^2 + 1)(x - 2) &= 2x^3 + 2x^2 - 2x - (x^3 - 2x^2 + x - 2) \\
 &= 2x^3 + 2x^2 - 2x - x^3 + 2x^2 - x + 2 \\
 &= x^3 + 4x^2 - 3x + 2.
 \end{aligned}$$

33. $(\sqrt{3}x + 2)(2x - \sqrt{3}) = 2\sqrt{3}x^2 - 3x + 4x - 2\sqrt{3} = 2\sqrt{3}x^2 + x - 2\sqrt{3}.$

34. $x(2x-1)(-3x-1) = x(-6x^2 - 2x + 3x + 1) = x(-6x^2 + x + 1) = -6x^3 + x^2 + x.$

35. $6x^3 - 12x^2 + 6x = 6x(x^2 - 2x + 1) = 6x(x-1)^2.$

36. $4x^3 - 9x = x(4x^2 - 9) = x(2x+3)(2x-3).$

37.

$$\begin{aligned}
 (2x+1)(-3x+12) + (2x-8)(x+1) &= -3(2x+1)(x-4) + 2(x-4)(x+1) \\
 &= (x-4)[-3(2x+1) + 2(x+1)] \\
 &= (x-4)[-6x-3+2x+2] \\
 &= (x-4)(-4x-1) \\
 &= -(x-4)(4x+1).
 \end{aligned}$$

38.

$$\begin{aligned}
 (x-3)^2 + 5(x-3) - (5x-15)(2x+1) &= (x-3)(x-3) + 5(x-3) - 5(x-3)(2x+1) \\
 &= (x-3)[(x-3) + 5 - 5(2x+1)]
 \end{aligned}$$

$$\begin{aligned}
 &= (x-3)[x-3+5-10x-5] \\
 &= (x-3)(-9x-3) \\
 &= -3(x-3)(3x+1).
 \end{aligned}$$

39. $\left(\frac{x}{3} + 9\right)^2 = \frac{x^2}{9} + 6x + 81.$

40. $(\sqrt{2}x - 1)^2 = 2x^2 - 2\sqrt{2}x + 1.$

41. $(7 - \sqrt{5}x)(7 + \sqrt{5}x) = 49 - 5x^2.$

42. $\frac{x^2}{4} + 5x + 25 = \left(\frac{x}{2} + 5\right)^2.$

43. $9x^2 - 6\sqrt{2}x + 2 = (3x - \sqrt{2})^2.$

44. $4x^2 - \frac{25}{9} = \left(2x + \frac{5}{3}\right)\left(2x - \frac{5}{3}\right).$

45.

$$\begin{aligned}
 1 + \frac{1}{x-2} - \frac{2x+1}{3x-6} &= \frac{1}{1} + \frac{1}{x-2} - \frac{2x+1}{3x-6} \\
 &= \frac{1 \times (3x-6)}{1 \times (3x-6)} + \frac{1 \times 3}{(x-2) \times 3} - \frac{2x+1}{3x-6} \\
 &= \frac{3x-6}{3x-6} + \frac{3}{3x-6} - \frac{2x+1}{3x-6} \\
 &= \frac{3x-6+3-(2x+1)}{3x-6} \\
 &= \frac{3x-6+3-2x-1}{3x-6} \\
 &= \frac{x-4}{3x-6}.
 \end{aligned}$$