Développements. Identités remarquables - Correction

Partie 1 : Développer et réduire les expressions suivantes :

$A = (4x-3)^2$

$A = (4x)^2 - 2 \times 4x \times 3 + 3^2$

$\boxed{A = 16x^2 - 24x + 9}$

$B = \left(\frac{5}{4} - 3x\right)^2$

$B = \left(\frac{5}{4}\right)^2 - 2 \times \frac{5}{4} \times 3x + (3x)^2$

$B = \left(\frac{25}{16}\right) - \frac{15}{2}x + 9x^2$

$\boxed{B = 9x^2 - \frac{15}{2}x + \frac{25}{16}}$

$C = (\sqrt{7} - 2x)^2$

$C = \left(\sqrt{7}\right)^2 - 2 \times \sqrt{7} \times 2x + (2x)^2$

$C = 7 - 4\sqrt{7}x + 4x^2$

$\boxed{C = 4x^2 - 4\sqrt{7} + 7}$

$D = (3\sqrt{6} - 5x)^2$

$D = \left(3\sqrt{6}\right)^2 - 2 \times 3\sqrt{6} \times 5x + (5x)^2$

$D = 9 \times 6 - 2 \times 3\sqrt{6} \times 5x + (5x)^2$

$D = 54 - 30\sqrt{6} \times x + 25x^2$

$\boxed{D = 25x^2 - 30\sqrt{6} + 54}$

$E = 4x - (x+7)^2$

$E = 4x - \left(x^2 + 14x + 49\right)$

$E = 4x - x^2 - 14x - 49$

$\boxed{E = -x^2 - 10x - 49}$

$F = 3(2+6x)^2$

$F = 3\left(4 + 24x + 36x^2\right)$

$F = 12 + 72x + 108x^2$

$\boxed{F = 108x^2 + 72x + 12}$

$G = 3 - (8-x)^2$

$G = 3 - \left(64 - 16x + x^2\right)$

$G = 3 - 64 + 16x - x^2$

$\boxed{G = -x^2 + 16x - 61}$

$H = 4 - 2(x-3)^2$

$H = 4 - 2\left(x^2 - 6x + 9\right)$

$H = 4 - 2x^2 + 12x - 18$

$\boxed{H = -2x^2 + 12x - 14}$

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

$I = (1-x)\left(x^2 + 10x + 25\right)$

$I = x^2 + 10x + 25 - x^3 - 10x^2 - 25x$

$\boxed{I = -x^3 - 9x^2 - 15x + 25}$

Partie 2 : Développer et réduire les expressions suivantes :

$J = (2 - 5x)(2 + 5x)$

$J = 2^2 - (5x)^2$

$\boxed{J = 4 - 25x^2}$

$K = \left(\frac{4}{3} - 5x\right)\left(\frac{4}{3} + 5x\right)$

$K = \left(\frac{4}{3}\right)^2 - (5x)^2$

$\boxed{K = \frac{16}{9} - 25x^2}$

$L = \left(\sqrt{5} + \sqrt{2}x\right)\left(\sqrt{5} - \sqrt{2}x\right)$

$L = \left(\sqrt{5}\right)^2 - \left(\sqrt{2}x\right)^2$

$\boxed{L = 5 - 2x^2}$

$M = \left(3\sqrt{2} + 4x\right)\left(3\sqrt{2} - 4x\right)$

$M = \left(3\sqrt{2}\right)^2 - (4x)^2$

$M = 9 \times 2 - 16x^2$

$\boxed{M = 18 - 16x^2}$

$N = 2(3 + 8x)(3 - 8x)$

$N = 2\left(3^2 - (8x)^2\right)$

$N = 2\left(9 - 64x^2\right)$

$\boxed{N = 18 - 128x^2}$

$O = 7x^2 - \left(\sqrt{3} + \frac{1}{\sqrt{5}}x\right)\left(\sqrt{3} - \frac{1}{\sqrt{5}}x\right)$

$O = 7x^2 - \left[\left(\sqrt{3}\right)^2 - \left(\frac{1}{\sqrt{5}}x\right)^2\right]$

$O = 7x^2 - \left[3 - \frac{1}{5}x^2\right]$

$O = 7x^2 - 3 + \frac{1}{5}x^2$

$\boxed{O = \frac{36}{5}x^2 - 3}$