

CALCUL LITERAL

EXERCICE 2

La Providence - Montpellier

CORRIGE - M. QUET

EXERCICE 1 : Réduire ces produits :

a. $2a \times 5 = 10a$	b. $6 \times 5a = 30a$
c. $4a \times (-2a) = -8a^2$	d. $(-2a) \times (-7a) = 14a^2$
e. $6a \times 7a = 42a^2$	f. $3a^2 \times 2a = 6a^3$
g. $(-2a) \times 5a^2 = -10a^3$	h. $(-a^2) \times a = -a^3$
i. $2a^3 \times (-3a) = -6a^4$	j. $5a^2 \times 3a^4 = 15a^6$

EXERCICE 2 : Réduire ces carrés :

$(2x)^2 = 2x \times 2x = 4x^2$	$(-3x)^2 = (-3x) \times (-3x) = 9x^2$
$-(3x)^2 = -(3x) \times (3x) = -9x^2$	$(-x^2)^2 = (-x^2) \times (-x^2) = x^4$
$(5x^2)^2 = (5x^2) \times (5x^2) = 25x^4$	$(-7x^2)^2 = (-7x^2) \times (-7x^2) = 49x^4$
$(2x^3)^2 = (2x^3) \times (2x^3) = 4x^6$	$(-5x^4)^2 = (-5x^4) \times (-5x^4) = 25x^8$
$(-3x^3)^2 = 9x^6$	$-2(3x^2)^2 = -2(3x^2) \times (3x^2) = -2 \times 9x^4 = -18x^4$

EXERCICE 3 : Réduire ces produits ou carrés :

$\frac{2}{3}x \times \frac{4}{5}x = \frac{2}{3} \times \frac{4}{5} \times x \times x = \frac{8}{15}x^2$	$\left(\frac{1}{2}x\right)^2 = \frac{1}{2}x \times \frac{1}{2}x = \frac{1}{4}x^2$
$\left(-\frac{5}{2}x\right) \times \frac{2}{3}x^2 = -\frac{5 \times 2}{2 \times 3} \times x^3 = -\frac{5}{3}x^3$	$\left(\frac{3}{7}x^2\right)^2 = \frac{3}{7}x^2 \times \frac{3}{7}x^2 = \frac{9}{49}x^4$
$\left(\frac{5}{4}x^3\right)^2 = \frac{5}{4}x^3 \times \frac{5}{4}x^3 = \frac{25}{16}x^6$	$\frac{2}{7}(3x)^2 = \frac{2}{7} \times 3x \times 3x = \frac{18}{7}x^2$
$-3\left(\frac{5}{3}x\right)^2 = -3 \times \frac{5}{3}x \times \frac{5}{3}x = -\frac{25}{3}x^2$	$\frac{10}{7}x^3 \times \frac{3}{5}x^2 = \frac{10 \times 3}{7 \times 5} \times x^5 = \frac{6}{7}x^5$

$$\left(\frac{3}{2}x\right)^2 \times \left(\frac{2}{3}x\right)^2 = \frac{9}{4}x^2 \times \frac{4}{9}x^2 = x^4$$

$$\frac{3}{5}\left(\frac{7}{2}x\right)^2 = \frac{3}{5} \times \frac{49}{4}x^2 = \frac{147}{20}x^2$$

EXERCICE 4

Utiliser les formules « $k(a + b) = ka + kb$ » et « $k(a - b) = ka - kb$ » pour développer les expressions suivantes :

$k(a + b) = ka + kb$
$3(a + 6) = 3a + 18$
$3(x + 4) = 3x + 12$
$a(a + 6) = a^2 + 6a$
$b(7 - b) = 7b - b^2$
$7(x^2 - 5) = 7x^2 - 35$
$5(a^2 - 3) = 5a^2 - 15$
$-2(x - 4) = -2x + 8$
$-6(2 - 3x) = -12 + 18x$
$-x(3x - x^2) = -3x^2 + x^3$
$x^2(-4x + 5) = -4x^3 + 5x^2$

EXERCICE 5 : Développer et réduire :

$\frac{1}{2}\left(\frac{3}{2}x + \frac{1}{5}\right) = \frac{1}{2} \times \frac{3}{2}x + \frac{1}{2} \times \frac{1}{5} = \frac{3}{4}x + \frac{1}{10}$
$-\frac{3}{5}\left(\frac{2}{3}x + \frac{4}{3}\right) = -\frac{3}{5} \times \frac{2}{3}x - \frac{3}{5} \times \frac{4}{3} = -\frac{2}{5}x - \frac{4}{5}$
$\frac{7}{5}\left(\frac{3}{2}x^2 - \frac{3}{7}\right) = \frac{7}{5} \times \frac{3}{2}x^2 - \frac{7}{5} \times \frac{3}{7} = \frac{21}{10}x^2 - \frac{3}{5}$
$-\frac{2}{5}x\left(\frac{3}{2}x + \frac{1}{5}\right) = -\frac{2}{5}x \times \frac{3}{2}x - \frac{2}{5}x \times \frac{1}{5} = -\frac{3}{5}x^2 - \frac{2}{25}x$
$-\frac{3}{4}x^2\left(\frac{5}{7} - \frac{3}{2}x\right) = -\frac{3}{4}x^2 \times \frac{5}{7} + \frac{3}{4}x^2 \times \frac{3}{2}x = -\frac{15}{28}x^2 + \frac{9}{8}x^3$

EXERCICE 6 : Développer puis réduire :

$A = 3(x - 2) + 5(3 - x)$
$A = 3 \times x - 3 \times 2 + 5 \times 3 - 5 \times x$
$A = 3x - 6 + 15 - 5x$
$A = -2x + 9$

$$B = x(3+x) - 2(x+5)$$

$$B = x \times 3 + x \times x - 2 \times x - 2 \times 5$$

$$B = 3x + x^2 - 2x - 10$$

$$B = x^2 + x - 10$$

$$C = -2(x-7) - 2(x^2+x) + 4(x^2+1)$$

$$C = -2 \times x + 2 \times 7 - 2 \times x^2 - 2 \times x + 4 \times x^2 + 4 \times 1$$

$$C = -2x + 14 - 2x^2 - 2x + 4x^2 + 4$$

$$C = -2x^2 + 4x^2 - 2x - 2x + 14 + 4$$

$$C = 2x^2 - 4x + 18$$

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

$$D = 2x \times (-x) + 2x \times 5 - x^2 \times 1 + x^2 \times x$$

$$D = -2x^2 + 10x - x^2 + x^3$$

$$D = +x^3 - 2x^2 - x^2 + 10x$$

$$D = x^3 - 3x^2 + 10x$$

$$E = -6x(2x^2 - 3x) - 3(x + 4x^2) - x(-3 + 4x)$$

$$E = -6x \times 2x^2 + 6x \times 3x - 3 \times x - 3 \times 4x^2 + x \times 3 - x \times 4x$$

$$E = -12x^3 + 18x^2 - 3x - 12x^2 + 3x - 4x^2$$

$$E = -12x^3 + 18x^2 - 12x^2 - 4x^2 - 3x + 3x$$

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

EXERCICE 7 : Développer puis réduire :

$$A = x(1-y) + y(1-z) + z(1-x) + xy + yz + xz$$

$$A = x \times 1 - xy + y \times 1 - yz + z \times 1 - zx + xy + yz + xz$$

$$A = x - xy + y - yz + z - zx + xy + yz + xz$$

$$A = x + y + z - xy + xy - yz + yz - zx + xz$$

$$A = x + y + z$$

$$B = x - [(1-y) - (z+1)]$$

$$B = x - [1 - y - z - 1]$$

$$B = x - [-y - z]$$

$$B = x + y + z$$