

Evaluation formative sur le calcul littéral

Corrigé

Toutes les étapes amenant aux résultats doivent figurer dans vos solutions.
Toute solution sans justification mathématique sera ignorée.
Durée : 40 minutes Points : 50

Problème 1 Calculer, réduire et ordonner:

25 points

a)
$$\left(6x^2 - \frac{4}{3}x - 2\right) + (x^3 + 3x^2 - 5x - 3) = 6x^2 - \frac{4}{3}x - 2 + x^3 + 3x^2 - 5x - 3 =$$

$$= x^3 + 9x^2 - \left(\frac{4}{3} + 5\right)x - 5 = x^3 + 9x^2 - \frac{19}{3}x - 5$$

b)
$$\left(\frac{1}{2}x^2 - 5\right) - \left(x^3 - \frac{3}{4}x^2 - 2x - 3\right) = \frac{1}{2}x^2 - 5 - x^3 + \frac{3}{4}x^2 + 2x + 3 = -x^3 + \left(\frac{1}{2} + \frac{3}{4}\right)x^2 + 2x - 2$$

$$= -x^3 + \frac{5}{4}x^2 + 2x - 2$$

c)
$$(x-5)(x+2) = x^2 + 2x - 5x - 10 = x^2 - 3x - 10$$

d)
$$5 - 4(x-4) = 5 - 4x + 16 = -4x + 21$$

e)
$$4(x^2 - 1) - 5(x^2 + 2x + 1) = 4x^2 - 4 - 5x^2 - 10x - 5 = -x^2 - 10x - 9$$

f)
$$(2x+7)^2 = (2x)^2 + 2 \cdot 2x \cdot 7 + 7^2 = 4x^2 + 28x + 49$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

g)
$$(x-6)^2 = x^2 - 2 \cdot x \cdot 6 + 6^2 = x^2 - 12x + 36$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

h)
$$\left(\frac{4}{5}x - \frac{2}{3}y\right)^2 = \left(\frac{4}{5}x\right)^2 - 2 \cdot \frac{4}{5}x \cdot \frac{2}{3}y + \left(\frac{2}{3}y\right)^2 = \frac{16}{25}x^2 - \frac{16}{15}xy + \frac{4}{9}y^2$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

i)
$$\left(\frac{1}{4}x - y\right) \cdot \left(\frac{1}{4}x + y\right) = \left(\frac{1}{4}x\right)^2 - y^2 = \frac{1}{16}x^2 - y^2$$

$$(a-b)(a+b) = a^2 - b^2$$

j)
$$(x+3)^2 + 2(x-6) - (x-4)^2 = x^2 + 6x + 9 + 2x - 12 - (x^2 - 8x + 16) =$$

$$(a+b)^2 = a^2 + 2ab + b^2 \quad = x^2 + 8x - 9 - x^2 + 8x - 16 = 16x - 25$$

$$(a-b)^2 = a^2 - 2ab + b^2$$

Problème 2 Compléter**9 points**

- a) $\left(\frac{x}{a} - \frac{4y}{b}\right)^2 = x^2 - 8xy + \frac{16y^2}{b^2}$
 $(a-b)^2 = a^2 - 2ab + b^2$
- b) $\left(x^2 + \frac{0,6y}{a+b}\right)^2 = \frac{x^4}{a^2} + \frac{1,2x^2y}{2ab} + 0,36y^2$
 $(a+b)^2 = a^2 + 2ab + b^2$
- c) $(5x - \frac{3y}{a-b})(\frac{5x}{a+b} + 3y) = \frac{25x^2}{a^2} - \frac{9y^2}{b^2}$
 $(a-b)(a+b) = a^2 - b^2$

Problème 3 Factoriser au maximum**16 points**

- a) $x^2 - 900 = (x-30)(x+30)$
 $a^2 - b^2 = (a-b)(a+b), a=x, b=30$
- b) $(x-y)^6 - (x-y)^5 = (x-y)^5(x-y) - (x-y)^5 \cdot 1 = \underline{(x-y)^5(x-y-1)}$
- c) $12xyz + 16x^2y + 4xy = \underline{4xy(3z + 4x + 1)}$
- d) $x^2 + 35x + 250 = \underline{(x+25)(x+10)}$
 $p+q=35, p \cdot q=250 \Rightarrow p=25, q=10$
- e) $x^2 - x - 42 = \underline{(x+6)(x-7)}$
 $p+q=-1, p \cdot q=42 \Rightarrow p=6, q=-7$
- f) $x^2 - 14x + 49 = \underline{(x-7)^2}$
 $a^2 - 2ab + b^2 = (a-b)^2, a=x, b=7, 2ab = 2 \cdot x \cdot 7 = 14x$
- g) $9x^2y + 6x^3yz + 15xy^2 = \underline{3xy(3x + 2x^2z + 5y)}$
- h) $ax - 6x + 6y - ay = (a-6)x - (a-6)y = \underline{(a-6)(x-y)}$