PRÉ-TEST

MAT-4106-1
Factorisation et fractions algébriques
FORME G

CORRIGÉ

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Pour rétroaction : www.csdps.qc.ca/odilon-gauthier

5 points

1. $14u^6v^6 - 49u^2v^5 + 21u^4v^4 =$
$7u^2v^4(2u^4v^2 - 7v + 3u^2)$

5 points

2. $16x^3 + 25y^3 - 20xy - 20x^2y^2 =$
$16x^3 - 20xy - 20x^2y^2 + 25y^3 =$
$4x(4x^2 - 5y) - 5y^2(4x^2 - 5y) =$
$(4x^2 - 5y)(4x - 5y^2)$

5 points

3.
$16p^2 - 8p - 3 =$
$16p^2 + 4p - 12p - 3 =$
$4p(4p + 1) - 3(4p + 1) =$
$(4p + 1)(4p - 3)$

5 points

4. $0,01a^{16} - \frac{4}{9}b^4 =$
$(0,1a^8 + \frac{2}{3}b^2)(0,1a^8 - \frac{2}{3}b^2)$

5 points

5.
$m^2 - 12mn + 36n^2 =$
$m^2 - 6mn - 6mn + 36n^2 =$
$m(m - 6n) - 6n(m - 6n) =$
$(m - 6n)(m - 6n)$ ou $(m - 6n)^2$

5 points

6. $392a^5b - 2ab =$
$2ab(196a^4 - 1)$
$2ab(14a^2 + 1)(14a^2 - 1)$

5 points

7. $-6xy^3 - 24x^2y^2 + 3y^4 =$

$-3y^2(2xy + 8x^2 - y^2) =$

$-3y^2(8x^2 + 2xy - y^2) =$

$-3y^2(8x^2 + 4xy - 2xy - y^2) =$

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

$-3y^2(2x + y)(4x - y)$

10 points

8. $\dfrac{2p^2}{-p^2 + 3p} \div \dfrac{2p^2 + 6p}{p^2 - 9} =$

$\dfrac{2p^2}{-p^2 + 3p} \times \dfrac{p^2 - 9}{2p^2 + 6p} =$

$\dfrac{2p^2}{-p(p - 3)} \times \dfrac{(p + 3)(p - 3)}{2p(p + 3)} =$

$\dfrac{\cancel{2}\ \cancel{p^2}}{-\cancel{p}\ \cancel{(p - 3)}} \times \dfrac{\cancel{(p + 3)}\ \cancel{(p - 3)}}{\cancel{2}\ \cancel{p}\ \cancel{(p + 3)}} =$

-1

10 points

9. $\dfrac{2a + b}{2a + 2b} + \dfrac{4a^2 - b^2}{2a^2 - 3ab + b^2} =$

$\dfrac{2a + b}{2(a + b)} + \dfrac{(2a + b)\ \cancel{(2a - b)}}{(a - b)\ \cancel{(2a - b)}} =$

$\dfrac{2a + b}{2(a + b)} + \dfrac{(2a + b)}{(a - b)} =$

$\dfrac{(2a + b)(a - b) + (2a + b)(2)(a + b)}{2(a + b)(a - b)} =$

$\dfrac{2a^2 - 2ab + ab - b^2 + 4a^2 + 2ab + 4ab + 2b^2}{2(a + b)(a - b)} =$

$\dfrac{6a^2 + 5ab + b^2}{2(a + b)(a - b)}$

5 points

10. $\dfrac{2bm-1-m+2b}{1-4b^2}=$

$\dfrac{2bm-m+2b-1}{1-4b^2}=$

$\dfrac{m(2b-1)+1(2b-1)}{(1-2b)(1+2b)}=$

$\dfrac{\cancel{(2b-1)}\,(m+1)}{-\cancel{(-1+2b)}\,(1+2b)}=$

$\dfrac{-(m+1)}{2b+1}$

10 points

11. $\dfrac{x^2-2xy+y^2}{x^2-y^2}\bullet\dfrac{x+y}{x^2-xy}=$

$\dfrac{(x-y)(x-y)}{(x+y)(x-y)}\bullet\dfrac{x+y}{x(x-y)}=$

$\dfrac{\cancel{(x-y)}\,\cancel{(x-y)}}{\cancel{(x+y)}\,\cancel{(x-y)}}\bullet\dfrac{\cancel{x+y}}{x\,\cancel{(x-y)}}=$

$\dfrac{1}{x}$

10 points

12. $\dfrac{2m^2-50}{2m^2+11m+5}-\dfrac{m^2}{m^2-3m}=$

$\dfrac{2\,\cancel{(m+5)}\,(m-5)}{\cancel{(m+5)}\,(2m+1)}-\dfrac{\cancel{m^2}}{\cancel{m}\,(m-3)}=$

$\dfrac{2(m-5)}{2m+1}-\dfrac{m}{m-3}=$

$\dfrac{2(m-5)(m-3)-m(2m+1)}{(2m+1)(m-3)}=$

$\dfrac{2m^2-6m-10m+30-2m^2-m}{(2m+1)(m-3)}=$

$\dfrac{-17m+30}{(2m+1)(m-3)}$

13.

10 points

$$\frac{8k-2}{4k}+\frac{9-4k^2}{2k^2+5k+3}=\frac{9k-1}{2k^2+2k}$$

$$\frac{\cancel{2}(4k-1)}{\cancel{2}\,4k}+\frac{\cancel{(3+2k)}(3-2k)}{\cancel{(2k+3)}(k+1)}=\frac{9k-1}{2k^2+2k}$$

$$\frac{4k-1}{2k}+\frac{3-2k}{k+1}=\frac{9k-1}{2k^2+2k}$$

$$\frac{(4k-1)(k+1)+2k(3-2k)}{2k(k+1)}=\frac{9k-1}{2k^2+2k}$$

$$\frac{4k^2+4k-k-1+6k-4k^2}{2k(k+1)}=\frac{9k-1}{2k^2+2k}$$

$$\frac{9k-1}{2k(k+1)}=\frac{9k-1}{2k^2+2k}$$

$$\frac{9k-1}{2k^2+2k}=\frac{9k-1}{2k^2+2k}$$

14.

5 points

$$\frac{x^2-x}{x^2-1}+\frac{1-x}{x}=\frac{1}{x}-\frac{x-1}{x^2-1}$$

$$\frac{x\cancel{(x-1)}}{(x+1)\cancel{(x-1)}}+\frac{1-x}{x}=\frac{1}{x}-\frac{\cancel{x-1}}{(x+1)\cancel{(x-1)}}$$

$$\frac{x}{x+1}+\frac{1-x}{x}=\frac{1}{x}-\frac{1}{x+1}$$

$$\frac{x\bullet x+(1-x)(x+1)}{x(x+1)}=\frac{1(x+1)-x}{x(x+1)}$$

$$\frac{x^2+x+1-x^2-x}{x(x+1)}=\frac{x+1-x}{x(x+1)}$$

$$\frac{1}{x(x+1)}=\frac{1}{x(x+1)}$$

15.

5 points

$$\frac{a+3}{a-1}-\frac{b^2+6b+5}{b^2-1}=\frac{4a}{a-1}-\frac{8b+4}{2(b-1)}$$

$$\frac{a+3}{a-1}-\frac{\cancel{(b+1)}(b+5)}{\cancel{(b+1)}(b-1)}=\frac{4a}{a-1}-\frac{\cancel{4}^{2}(2b+1)}{\cancel{2}(b-1)}$$

$$\frac{a+3}{a-1}-\frac{b+5}{b-1}=\frac{4a}{a-1}-\frac{2(2b+1)}{b-1}$$

$$\frac{(a+3)(b-1)-(b+5)(a-1)}{(a-1)(b-1)}=\frac{4a(b-1)-2(2b+1)(a-1)}{(a-1)(b-1)}$$

$$\frac{ab-a+3b-3-ab+b-5a+5}{(a-1)(b-1)}=\frac{4ab-4a-4ab+4b-2a+2}{(a-1)(b-1)}$$

$$\frac{-6a+4b+2}{(a-1)(b-1)}=\frac{-6a+4b+2}{(a-1)(b-1)}$$