

Classe: 1SSI	Date: 29/05/2013	<u>Type</u> <u>Interrogation sujet A</u>
<u>Devoir n°16</u>		
Thème: Dérivation		

Calculer les fonctions dérivées des fonctions suivantes:

$$1^{\circ}) f(x) = -5x^3 + 4x^2 - 9x - 5.$$

$$2^{\circ}) f(x) = \frac{x^4}{2} - \frac{5x^3}{3} + 3x^2 - 2x + 1.$$

$$3^{\circ}) f(x) = 5x + \frac{1}{x}.$$

$$4^{\circ}) f(x) = \frac{1}{x^2} - \frac{1}{3}x^2 + 2.$$

$$5^{\circ}) f(x) = \frac{3}{x+1}.$$

$$6^{\circ}) f(x) = \frac{x-2}{3x+1}.$$

$$7^{\circ}) f(x) = \frac{2}{5x} - \frac{3x}{4}.$$

$$8^{\circ}) f(x) = \frac{x^2 - 4x + 8}{2x - 5}.$$

Classe: 1SSI	Date: 29/05/2013	<u>Type</u> <u>Interrogation sujet B</u>
<u>Devoir n°16</u>		
Thème: Dérivation		

Calculer les fonctions dérivées des fonctions suivantes:

$$1^{\circ}) f(x) = -2x^3 + 2x^2 - 7x - 1.$$

$$2^{\circ}) f(x) = \frac{x^4}{4} - \frac{7x^3}{3} + 2x^2 - 2x - 1.$$

$$3^{\circ}) f(x) = 3x + \frac{1}{x}.$$

$$4^{\circ}) f(x) = \frac{1}{x^2} - \frac{1}{5}x^2 + 8.$$

$$5^{\circ}) f(x) = \frac{2}{x+1}.$$

$$6^{\circ}) f(x) = \frac{x-3}{2x+1}.$$

$$7^{\circ}) f(x) = \frac{2}{3x} - \frac{5x}{4}.$$

$$8^{\circ}) f(x) = \frac{x^2 - 4x + 7}{2x - 3}.$$

corrigé du devoir (Sujet A)

1°) $f(x) = -5x^3 + 4x^2 - 9x - 5$

$f'(x) = -15x^2 + 8x - 9$

0,5pt

2°) $f(x) = \frac{x^4}{2} - \frac{5x^3}{3} + 3x^2 - 2x + 1 = \frac{1}{2}x^4 - \frac{5}{3}x^3 + 3x^2 - 2x + 1$

$f'(x) = \frac{1}{2} \times 4x^3 - \frac{5}{3} \times 3x^2 + 3 \times 2x - 2$

$f'(x) = 2x^3 - 5x^2 + 6x - 2$

1pt

3°) $f(x) = 5x + \frac{1}{x}$

$f'(x) = 5 - \frac{1}{x^2}$

1pt

4°) $f(x) = \frac{1}{x^2} - \frac{1}{3}x^2 + 2 = x^{-2} - \frac{1}{3}x^2 + 2$

$f'(x) = -2x^{-3} - \frac{1}{3} \cdot 2x$

$f'(x) = -\frac{2}{x^3} - \frac{2}{3}x$

1,5pts

5°) $f(x) = \frac{3}{x+1} = \frac{3}{u} = 3 \times \frac{1}{u}$

$f'(x) = 3 \times \left(-\frac{u'}{u^2} \right) = -3 \times \frac{1}{(x+1)^2}$

$f'(x) = \frac{-3}{(x+1)^2}$

1,5pts

6°) $f(x) = \frac{x-2}{3x+1} = \frac{u}{v}$

avec $u = x-2$
 $v = 3x+1$

2/4

$$f'(x) = \frac{u'v - uv'}{v^2} = \frac{1 \times (3x+1) - (x-2) \times 3}{(3x+1)^2} = \frac{3x+1 - 3x+6}{(3x+1)^2}$$

$$\boxed{f'(x) = \frac{7}{(3x+1)^2}}$$

15pts

$$7^o) f(x) = \frac{2}{5x} - \frac{3x}{4} = \frac{2}{5} \times \left(\frac{1}{x}\right) - \frac{3}{4}x$$

$$\boxed{f'(x) = \frac{2}{5} \times \left(-\frac{1}{x^2}\right) - \frac{3}{4} = -\frac{2}{5x^2} - \frac{3}{4}}$$

15pts

$$8^o) f(x) = \frac{x^2 - 4x + 8}{2x - 5} = \frac{u}{v} \quad \text{avec} \quad \begin{cases} u = x^2 - 4x + 8 \\ v = 2x - 5 \end{cases}$$

$$f'(x) = \frac{u'v - uv'}{v^2} = \frac{(2x-4)(2x-5) - (x^2-4x+8) \times 2}{(2x-5)^2}$$

$$f'(x) = \frac{4x^2 - 10x - 8x + 20 - 2x^2 + 8x - 16}{(2x-5)^2}$$

$$\boxed{f'(x) = \frac{2x^2 - 10x + 4}{(2x-5)^2}}$$

15pts

Corrigé du devoir (Sujet B)

$$1^o) f(x) = -2x^3 + 2x^2 - 7x - 1$$

$$f'(x) = -2 \times 3x^2 + 2 \times 2x - 7$$

$$f'(x) = -6x^2 + 4x - 7$$

0,5 pt

$$2^o) f(x) = \frac{1}{4}x^4 - \frac{7}{3}x^3 + 2x^2 - 2x - 1$$

$$f'(x) = \frac{1}{4} \times 4x^3 - \frac{7}{3} \times 3x^2 + 2 \times 2x - 2$$

$$f'(x) = x^3 - 7x^2 + 4x - 2$$

1 pt

$$3^o) f(x) = 3x + \frac{1}{x}$$

$$f'(x) = 3 - \frac{1}{x^2}$$

1 pt

$$4^o) f(x) = \frac{1}{x^2} - \frac{1}{5}x^2 + 8 = x^{-2} - \frac{1}{5}x^2 + 8$$

$$f'(x) = -2x^{-3} - \frac{1}{5} \times (2x)$$

$$f'(x) = -\frac{2}{x^3} - \frac{2}{5}x$$

1,5 pts

$$5^o) f(x) = \frac{2}{x+1} = 2 \times \frac{1}{x+1} = 2 \times \frac{1}{u}$$

$$f'(x) = 2 \times \left(-\frac{u'}{u^2} \right) = 2 \times \left(-\frac{1}{(x+1)^2} \right)$$

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

1,5 pts

4/4

$$6^o) f(x) = \frac{x-3}{2x+1} = \frac{u}{v} \quad \text{avec} \quad \begin{cases} u = x-3 & u' = 1 \\ v = 2x+1 & v' = 2 \end{cases}$$

$$f'(x) = \frac{u'v - uv'}{v^2} = \frac{1 \times (2x+1) - (x-3) \times 2}{(2x+1)^2}$$

$$f'(x) = \frac{2x+1-2x+6}{(2x+1)^2} = \frac{7}{(2x+1)^2}$$

1,5 pts

$$7^o) f(x) = \frac{2}{3x} - \frac{5x}{4} = \frac{2}{3} \cdot \left(\frac{1}{x}\right) - \frac{5}{4}x$$

$$f'(x) = \frac{2}{3} \times \left(-\frac{1}{x^2}\right) - \frac{5}{4}$$

$$f'(x) = -\frac{2}{3x^2} - \frac{5}{4}$$

1,5 pts

$$8^o) f(x) = \frac{x^2-4x+7}{2x-3} = \frac{u}{v} \quad \text{avec} \quad \begin{cases} u = x^2-4x+7 & u' = 2x-4 \\ v = 2x-3 & v' = 2 \end{cases}$$

$$f'(x) = \frac{u'v - uv'}{v^2} = \frac{(2x-4)(2x-3) - (x^2-4x+7) \times 2}{(2x-3)^2}$$

$$f'(x) = \frac{4x^2-6x-8x+12-2x^2+8x-14}{(2x-3)^2}$$

$$f'(x) = \frac{2x^2-6x-2}{(2x-3)^2}$$

1,5 pts