

## DM 7

• **PARTIE A**

1.  $f'(x) = 3ax^2 + 2bx + c$

2.  $f(0) : a(0)^3 + b(0)^2 + c(0) + d = 0$

$$f(0) : d = 0 \text{ Donc la courbe passe par } (0;0)$$

$$f'(x) : 3ax^3 + 2bx^2 + c = -0.6 \quad f'(0) : 3a(0)^2 + 2b(0) + c = -0.6$$

$$\text{Donc } f'(0) : c = -0.6$$

Donc  $c = -0.6$  et  $d = 0$ .  $d$  est l'ordonnée à l'origine et passe par le point  $O(0;0)$ .

3. La courbe doit passer par le point  $A(6;3.6)$

$$f(6) : a \times (6)^3 + b \times (6)^2 + (-0.6) \times (6) = 3.6$$

$$f(6) : 216a + 36b - 3.6 = 3.6$$

$$f(6) : 216a + 36b = 7.2$$

Et la tangente de A,

$$f'(A) = 0 \Leftrightarrow 3 \times a \times 6^2 + 2 \times b \times -0.6 = 0$$

$$f'(A) : 108a + 12b - 0.6 = 0$$

$$f'(A) : 108a + 12b = 0.6$$

$$\text{System: } \begin{cases} 216a + 36b - 3.6 = 3.6 \\ 108a + 12b = 0.6 \end{cases} \Leftrightarrow \begin{cases} 216a + 36b = 7.2 \\ 108a + 12b = 0.6 \end{cases}$$

$$\Leftrightarrow \text{On divise par 3} \begin{cases} 72a + 12b = 2.4 \\ 108a + 12b = 0.6 \end{cases}$$

4.  $\begin{cases} 72a + 12b = 2.4 \\ 108a + 12b = 0.6 \end{cases} \Leftrightarrow \begin{cases} 72a + 12b = 2.4 \\ 108a - 72a = -1.8 \end{cases}$

$$\Leftrightarrow \begin{cases} 72a + 12b = 2.4 \\ 108a + 12b = 0.6 \end{cases} \Leftrightarrow \begin{cases} 72a + 12b = 2.4 \\ 36a = -1.8 \end{cases}$$

$$\Leftrightarrow \begin{cases} 72a + 12b = 2.4 \\ a = -0.05 \end{cases} \Leftrightarrow \begin{cases} 72 \times (-0.05) + 12b = 2.4 \\ a = -0.05 \end{cases} \Leftrightarrow \begin{cases} -3.6 + 12b = 2.4 \\ a = -0.05 \end{cases}$$

$$\Leftrightarrow \begin{cases} 12b = 2.4 + 3.6 \\ a = -0.05 \end{cases} \Leftrightarrow \begin{cases} 12b = 6 \\ a = -0.05 \end{cases} \Leftrightarrow \begin{cases} b = \frac{6}{12} \\ a = -0.05 \end{cases} \Leftrightarrow \begin{cases} b = 0.5 \\ a = -0.05 \end{cases}$$

$$\text{Donc } f(x) = -0.05x^3 + 0.5x^2 - 0.6x + 0$$

• **PARTIE B**

1.  $f(4) = -0.05 \times 4^3 + 0.5 \times 4^2 - 0.6 \times 4$

$$f(4) = -3.2 + 8 - 2.4$$

$$f(4) = 2.4$$

$$\text{Donc } f(4) = 2.4$$

2.  $f'(4) = 3 \times (-0.05) \times 4^2 + 0.5 \times 4 - 0.6$

$$f'(4) = -0.15 \times 16 + 1 \times 4 - 0.6$$

$$f'(4) = -2.4 + 4 - 0.6$$

$$f'(4) = 1$$

$$\text{Donc } f'(4) = 1$$

## • PARTIE C

1.  $\text{uuuuuu}0.27\ 0.27\ 0.27\ \text{xunit}=2.0\text{cm},\text{yunit}=2.0\text{cm}\ (-2.15,-2.8)(8.45,3.15)\ [\text{subgriddiv}=0,\text{gridlabels}=0,\text{gridc}$   
 $2.15,-2.8)(8.45,3.15)\ \text{xunit}=1.0\text{cm},\text{yunit}=1.0\text{cm},\text{algebraic}=\text{true},\text{dotstyle}=\text{o},\text{dotsize}=3\text{pt}\ 0,\text{linewidth}=0.8\text{p}$   
 $2,\text{arrowinset}=0.25\ [\text{labelFontSize}=\text{,}\text{xAxis}=\text{true},\text{yAxis}=\text{true},\text{Dx}=2,\text{Dy}=2,\text{ticksize}=-2\text{pt}0,\text{subticks}=2]\rightarrow(0,0)(-4.3,-5.6)(16.9,6.3)$   
 $2\text{pt},\text{plotpoints}=200]2.8000002112222806E-83.999999843372777((0**x)**(x**4))*(-0.05*x^3+0.5*x^2-0.6*x)[\text{linewidth}=2\text{pt}]0.299066033364553$   
 $4\text{pt}0,\text{dotstyle}=\text{*,linecolor}=\text{uuuuuu}](4,2.4)[\text{bl}](3.64,2.58)\text{E}[\text{bl}](0.2,-0.3)\text{h}[\text{dotsize}=4\text{pt}0,\text{dotstyle}=\text{*,linecolor}=\text{uuuuuu}](9.64,1)[\text{bl}](9.72,1.16)\text{F}[\text{bl}](7.32,3.42)\text{d}$

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