Corrigé TE N°3 - 2Mg - Niv 1

a)

$f(x)$	−	‖	+	0	−	0	+	‖	−

b) A.V. en $x = 0$ et $x = 3$

A.H. en $y = -2$

c) $f'(x) = \dfrac{-2\overbrace{\left((x-1)+(x-2)\right)}^{2x-3}\cdot x(x-3) + 2(x-2)(x-1)\cdot(2x-3)}{x^2(x-3)^2}$

$= \dfrac{2(2x-3)\left(-x(x-3) + (x-2)(x-1)\right)}{x^2(x-3)^2}$

$= \dfrac{2(2x-3)\left(\cancel{-x^2+3x} + \cancel{x^2-3x}+2\right)}{x^2(x-3)^2}$

d) $= \dfrac{4(2x-3)}{x^2(x-3)^2} = 0 \Rightarrow 2x-3=0 \Rightarrow x = \dfrac{3}{2} \Rightarrow y = \dfrac{-2\cdot\left(-\frac{1}{2}\right)\cdot\frac{1}{2}}{\frac{9}{4}-\frac{9}{2}} = \dfrac{\frac{1}{2}}{-\frac{9}{4}}$

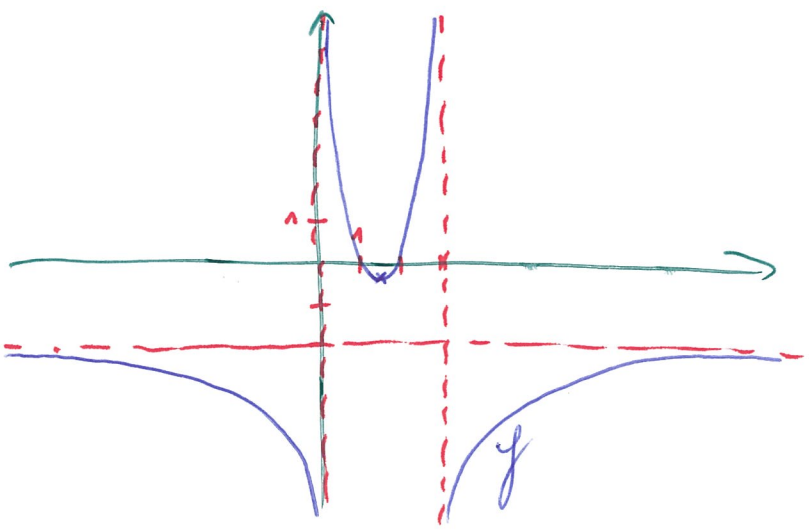
$= -\dfrac{2}{9}$

$\Rightarrow$ PTH en $\left(\dfrac{3}{2}; -\dfrac{2}{9}\right)$

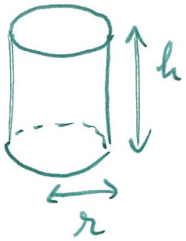
e)

x		0		$\frac{3}{2}$		3	
$f'(x)$	−	‖	−	0	+	‖	+
$f(x)$	↘	‖	↘	Min	↗	‖	↗

f)



Ex. 2 :



$$V = \pi \cdot r^2 \cdot h = 648\pi \Rightarrow h = \frac{648}{r^2}$$

$$C = \pi \cdot r^2 \cdot 15 + 2\pi r \cdot h \cdot 5$$

$$C(r) = 15\pi r^2 + 2\pi r \cdot \frac{648}{r^2} \cdot 5$$

$$C(r) = 15\pi r^2 + \frac{6480\pi}{r}, \quad r \in \mathbb{R}_+^*$$

$$C'(r) = 30\pi r - \frac{6480\pi}{r^2} = 0$$

$$30\pi r^3 = 6480\pi$$

$$r = \sqrt[3]{216}$$

$$r = 6$$

r		6	
$C'(r)$	−	0	+
$C(r)$	↘	Min	↗

Les dimensions optimales correspondent à un rayon de 6 cm et une hauteur de 18 cm.