Avril 2017

1) 11) $[A] = m.s^{-1}$ homogène à une vitesse

$[B] = m.s^{-2}$ " " " accélération

12) $x = At \Rightarrow t = \frac{x}{A}$

$y = Bt(t-\tau) = B\frac{x}{A}\left(\frac{x}{A} - \tau\right)$ avec $A=2$; $B=4$; $\tau=1$

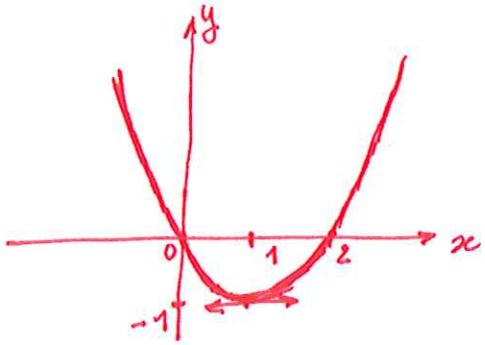
$$\boxed{y = x^2 - 2x}$$

13) $y' = 2x - 2$ $\quad y'=0 : x=1 : y=-1$

$y=0 : x=0 ; x=2$ $\quad y=+\infty : x = \pm\infty$

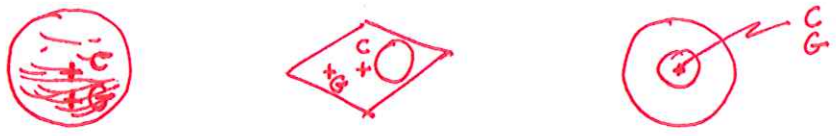
$y'>0 : x>1$ $\quad y'<0 : x<1$

x	$-\infty$		1		$+\infty$
y'		$-$	0	$+$	
y	$+\infty$	↘	-1	↗	$+\infty$

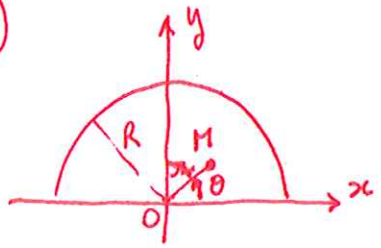


2) 21) $\vec{OC} = \frac{1}{V}\int \vec{OM}\, dV$ $\quad \vec{OG} = \frac{1}{m}\int \vec{OM}\, dm$

22)



3)



plans de symétrie : (yOz) et $(xOy) \Rightarrow G \in Oy$

$\rightarrow$ $m y_G = \int y\, dm$ $\quad \left| \begin{array}{l} y = r\sin\theta \\ dm = \sigma\, r\, dr\, d\theta \end{array} \right.$

$$\rightarrow m y_G = \sigma \int_0^R r^2\, dr \int_0^{\pi} \sin\theta\, d\theta = \sigma \frac{R^3}{3}\left[-\cos\theta\right]_0^{\pi} = \frac{2\sigma R^3}{3}$$

$m = \sigma S = \sigma . \pi R^2/2 \rightarrow$ $\boxed{y_G = \frac{4R}{3\pi}}$