Dérivée de fonctions usuelles (suite)

$f(x)$	$f'(x)$
$\sin(x)$	$\cos(x)$
$\cos(x)$	$-\sin(x)$
$\tan(x)$	$\dfrac{1}{\cos^2(x)} = 1+\tan^2(x)$

- si $f(x) = \sin(x)$

$$f'(a) = \lim_{h\to 0} \frac{f(a+h) - f(a)}{h} = \lim_{h\to 0} \frac{\sin(a+h) - \sin(a)}{h}$$

sin. d'une somme (formulaire)

$$= \lim_{h\to 0} \frac{\sin(a)\cos(h) + \cos(a)\sin(h) - \sin(a)}{h}$$

$$= \lim_{h\to 0} \frac{\sin(a)\cos(h) - \sin(a)}{h} + \lim_{h\to 0} \frac{\cos(a)\sin(h)}{h}$$

$$= \lim_{h\to 0} \frac{\sin(a)(\cos(h)-1)}{h} + \lim_{h\to 0} \cos(a) \cdot \frac{\sin(h)}{h}$$

$$= \sin(a) \underbrace{\lim_{h\to 0} \frac{\cos(h)-1}{h}}_{=0} + \cos(a) \underbrace{\lim_{h\to 0} \frac{\sin(h)}{h}}_{=1}$$

(ex 2.6.9) ou form. CRM p.76

(exple de cours thm des 2 gendarmes) idem

$$= \cos(a)$$

- dém similaire pour $(\cos(x))'$

$$\left(\frac{u}{v}\right)' = \frac{u'v - uv'}{v^2}$$

- $$(\tan(x))' = \left(\frac{\sin(x)}{\cos(x)}\right)' = \frac{\cos(x)\cos(x) + \sin(x)\sin(x)}{\cos^2(x)}$$

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

$$\underline{\text{ou}} = \frac{\cos^2(x)}{\cos^2(x)} + \left(\frac{\sin(x)}{\cos(x)}\right)^2 = 1 + \tan^2(x)$$