

RAPPEL : dérivées des fonctions circulaires et de composées de fonctions circulaires

fonction :	$f(x) = \cos x$	$f(x) = \sin x$	$f(x) = \cos(u(x))$	$f(x) = \sin(u(x))$
fonction dérivée :	$f'(x) = -\sin x$	$f'(x) = \cos x$	$f'(x) = -u'(x)\sin(u(x))$	$f'(x) = u'(x)\cos(u(x))$

EXERCICE 2A.1

Déterminer la fonction dérivée de la fonction f (définie et dérivable sur l'intervalle \mathbb{R}).

1. $f(x) = -2\sin x$

2. $f(x) = 5\cos x + 3\sin x$

3. $f(x) = \frac{\cos x - \sin x}{2}$

4. $f(x) = \cos x \sin x$

5. $f(x) = x \sin x$

6. $f(x) = x^2 \cos x$

7. $f(x) = (2x+1)\sin x$

8. $f(x) = \sin^2 x$

9. $f(x) = 3\cos^2 x$

10. $f(x) = \cos^2 x \sin x$

EXERCICE 2A.2

Déterminer la fonction dérivée de la fonction f (définie et dérivable sur l'intervalle \mathbb{R}).

1. $f(x) = \sin(2x+3)$

2. $f(x) = \cos 3x$

3. $f(x) = -4\cos(3x+2)$

4. $f(x) = \frac{1}{\pi} \sin\left(\pi x + \frac{\pi}{6}\right)$

5. $f(x) = \sin\left(\frac{\pi}{2}x\right)$

6. $f(x) = \cos 5x - \sin 4x$

7. $f(x) = \cos(3x)\sin(2x)$

8. $f(x) = \cos^2 3x$

9. $f(x) = -3\sin^2 2x$

10. $f(x) = \cos^2\left(\frac{\pi}{2}x\right)$

CORRIGE – NOTRE DAME DE LA MERCI**EXERCICE 2A.1**

1. $f(x) = -2 \sin x$

$f'(x) = -2 \cos x$

2. $f(x) = 5 \cos x + 3 \sin x$

$f'(x) = -5 \sin x + 3 \cos x$

3. $f(x) = \frac{\cos x - \sin x}{2}$

$f'(x) = \frac{-\sin x - \cos x}{2}$

4. $f(x) = \cos x \sin x$

$f'(x) = -\sin x \sin x + \cos x \cos x$

$f'(x) = \cos^2 x - \sin^2 x = 2 \cos^2 x - 1$

$f'(x) = \cos 2x$

5. $f(x) = x \sin x$

$f'(x) = \sin x + x \cos x$

6. $f(x) = x^2 \cos x$

$f'(x) = 2x \cos x - x^2 \sin x$

7. $f(x) = (2x+1) \sin x$

$f'(x) = 2 \sin x + (2x+1) \cos x$

8. $f(x) = \sin^2 x$

$f'(x) = 2 \sin x \cos x = \sin 2x$

9. $f(x) = 3 \cos^2 x$

$f'(x) = 3 \times 2 \cos x (-\sin x)$

$f'(x) = -6 \cos x \sin x = -3 \sin 2x$

10. $f(x) = \cos^2 x \sin x$

$f'(x) = 2 \cos x \times (-\sin x) \times \sin x + \cos^2 x \times \cos x$

$f'(x) = \cos x \times (\cos^2 x - 2 \sin^2 x)$

$f'(x) = \cos x \times (\cos^2 x - 2(1 - \cos^2 x))$

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

ON RAPPELLE QUE : $\sin(2a) = 2 \times \sin a \times \cos a$ **MONTPELLIER – M. QUET****EXERCICE 2A.2**

1. $f(x) = \sin(2x+3)$

$f'(x) = 2 \cos(2x+3)$

2. $f(x) = \cos 3x$

$f'(x) = -3 \sin 3x$

3. $f(x) = -4 \cos(3x+2)$

$f'(x) = 12 \sin(3x+2)$

4. $f(x) = \frac{1}{\pi} \sin\left(\pi x + \frac{\pi}{6}\right)$

$f'(x) = \frac{1}{\pi} \times \pi \cos\left(\pi x + \frac{\pi}{6}\right) = \cos\left(\pi x + \frac{\pi}{6}\right)$

5. $f(x) = \sin\left(\frac{\pi}{2} x\right)$

$f'(x) = \frac{\pi}{2} \cos\left(\frac{\pi}{2} x\right)$

6. $f(x) = \cos 5x - \sin 4x$

$f'(x) = -5 \sin 5x - 4 \cos 4x$

7. $f(x) = \cos(3x) \sin(2x)$

$f'(x) = -3 \sin(3x) \sin(2x) + \cos(3x) \times 2 \cos(2x)$

8. $f(x) = \cos^2 3x$

$f'(x) = 2 \cos 3x \times (-3 \sin 3x)$

$f'(x) = -6 \cos 3x \sin 3x = -3 \sin 6x$

9. $f(x) = -3 \sin^2 2x$

$f'(x) = -3 \times 2 \sin 2x \times (2 \cos 2x)$

$f'(x) = -12 \sin 2x \cos 2x = -6 \sin 4x$

10. $f(x) = \cos^2\left(\frac{\pi}{2} x\right)$

$f'(x) = 2 \cos\left(\frac{\pi}{2} x\right) \times \left[-\frac{\pi}{2} \sin\left(\frac{\pi}{2} x\right)\right]$

$f'(x) = -\pi \cos\left(\frac{\pi}{2} x\right) \sin\left(\frac{\pi}{2} x\right)$

$f'(x) = -\frac{\pi}{2} \sin(\pi x)$