

LDDR Niveau 1: TE 2 Trigo.

Exercice 1 $\sin t = +\frac{2}{\sqrt{5}} \quad t \in \Pi$

$$\begin{aligned}\cos^2 t + \sin^2 t &= 1 \Rightarrow \cos^2 t = 1 - \frac{4}{5} \Rightarrow \cos^2 t = \frac{1}{5} \Rightarrow \cos t = \pm \frac{1}{\sqrt{5}} \\ t \in \Pi &\Rightarrow \cos t = -\frac{1}{\sqrt{5}} = -\frac{\sqrt{5}}{5} \\ \tan t &= \frac{\sin t}{\cos t} = \frac{+\frac{2}{\sqrt{5}}}{-\frac{\sqrt{5}}{5}} = -\frac{2 \cdot 5}{5} = -2\end{aligned}$$

Exercice 2 a) 1) $\frac{\cos x \cdot \sin x}{\cos^2 x - 1} = \frac{\cos x \cdot \sin x}{-\sin^2 x} = -\frac{\cos x}{\sin x} = -\frac{1}{\tan x}$

$$\begin{aligned}2) \frac{\sin x - \sin^3 x}{\tan x} &= \frac{\sin x(1 - \sin^2 x)}{\frac{\sin x}{\cos x}} = \frac{\sin x(1 - \sin^2 x) \cdot \cos x}{\sin x} \\ &= (1 - \sin^2 x) \cos x\end{aligned}$$

$$\begin{aligned}b) \frac{1}{\cos x} - \frac{\cos x}{\sin^2 x} &= \frac{\sin^2 x - \cos^2 x}{\cos x \cdot \sin^2 x} = \frac{1 - 2\cos^2 x}{\cos x(1 + \cos^2 x)} \\ &= \frac{1 - 2\cos^2 x}{\cos x - \cos^3 x}\end{aligned}$$

Exercice 3 1) $\sqrt{8} + 4 \sin x = 0 \Leftrightarrow 4 \sin x = -\sqrt{8} \Rightarrow 4 \sin x = -2\sqrt{2} \Rightarrow$
 $\Rightarrow \sin x = -\frac{\sqrt{2}}{2} \Rightarrow \begin{cases} x = -\frac{\pi}{4} + 2k\pi \\ x = \pi + \frac{\pi}{4} + 2k\pi = \frac{5\pi}{4} + 2k\pi \end{cases}$

$$2) \cos(2x) = \frac{1}{\sqrt{3}} \Rightarrow \begin{cases} 2x = 54.73^\circ + k360 \Rightarrow x = 27.37^\circ + k180 \\ 2x = -54.73^\circ + k360 \Rightarrow x = -27.37^\circ + k180 \end{cases}$$

$$3) 2 \tan(x - 30) = -7 \Rightarrow \tan(x - 30) = -3.5 =$$

$$x - 30 = -74.05^\circ + k180^\circ \Rightarrow x = -44.05^\circ + k180^\circ$$

$$k=0 \quad x$$

$$k=1 \quad x$$

$$k=2 \quad x$$

$$k=3 \quad x$$

$$\boxed{k=4} \quad x = 675.95^\circ \checkmark$$

$$k=5 \quad x$$

EXERCISE 4

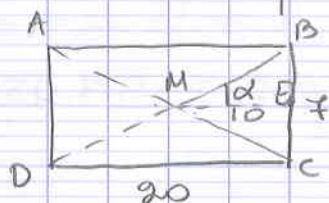
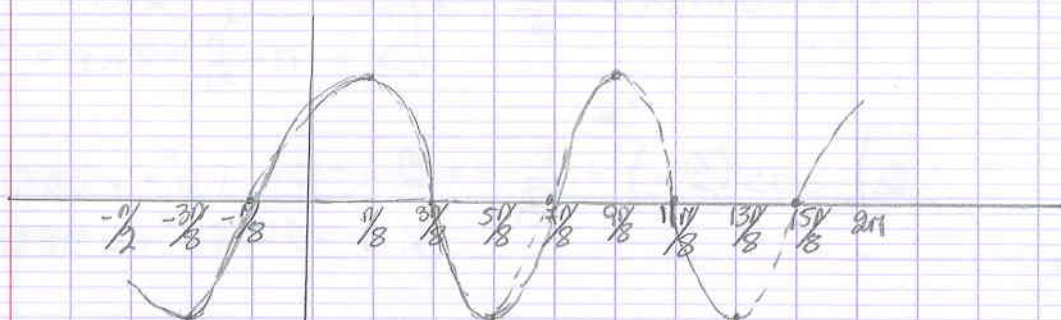
a)



x	$-\frac{\pi}{2}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$\cos x$	0	1	0	-1	0	1
$1 - \cos 2x$	1	0	1	2	1	0

b) $g(x) = 2 \sin(2x + \frac{\pi}{4})$

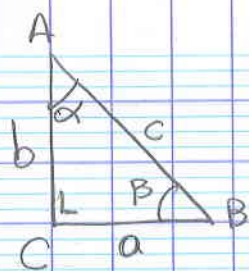
x	$-\frac{\pi}{2}$	$-\frac{3\pi}{8}$	$-\frac{\pi}{8}$	0	$\frac{\pi}{8}$	$\frac{3\pi}{8}$	$\frac{5\pi}{8}$	$\frac{7\pi}{8}$	$\frac{9\pi}{8}$	$\frac{11\pi}{8}$	$\frac{13\pi}{8}$	$\frac{15\pi}{8}$	2π
$2x$	$-\pi$	$-\frac{3\pi}{4}$	$-\frac{\pi}{4}$	0	$\frac{\pi}{4}$	$\frac{3\pi}{4}$	$\frac{5\pi}{4}$	$\frac{7\pi}{4}$	$\frac{9\pi}{4}$	$\frac{11\pi}{4}$	$\frac{13\pi}{4}$	$\frac{15\pi}{4}$	4π
$2x + \frac{\pi}{4}$	$-\frac{3\pi}{4}$	$-\frac{\pi}{2}$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π	$\frac{5\pi}{4}$	$\frac{3\pi}{2}$	2π	$\frac{9\pi}{4}$	$\frac{7\pi}{2}$	$\frac{17\pi}{4}$
$\sin(2x + \frac{\pi}{4})$	$-\frac{\sqrt{2}}{2}$	-1	0	$\frac{\sqrt{2}}{2}$	1	0	-1	0	$+1$	0	-1	0	$\frac{\sqrt{2}}{2}$
$2 \sin(2x + \frac{\pi}{4})$	$\sqrt{2}$	-2	0	$\sqrt{2}$	2	0	-2	0	$+2$	0	-2	0	$\sqrt{2}$



EXERCISE 5

$$\tan \alpha = \frac{3.5}{10} \Rightarrow \alpha = 19.29^\circ$$

$$\Rightarrow \varphi = 2\alpha \Rightarrow \varphi = 38.58^\circ$$

EXERCICE 6

$$1) \tan \alpha = \frac{a}{b} \quad \cos \alpha = \frac{b}{c}$$

$$\frac{\tan \alpha}{\cos \alpha} = \frac{\frac{a}{b}}{\frac{b}{c}} = \frac{a}{b} \cdot \frac{c}{b} = \frac{a \cdot c}{b^2}$$

$$2) \frac{1}{\sin \beta} + \frac{1}{\tan \beta} = \frac{1}{\frac{b}{c}} + \frac{1}{\frac{b}{a}} = \frac{c}{b} + \frac{a}{b} = \frac{a+c}{b}$$