exercice: 1

$$M = \begin{pmatrix} -1 & -2 \\ 1 & 1 \end{pmatrix}$$

$$M^{2025} = ?$$

exercice: 2

f définie sur $[1; +\infty[$

tell que f dérivable sur $[1; +\infty[$ et

$$\lim_{+\infty} f'(x) = 2 \quad \text{alors}$$

$$\lim_{+\infty} \frac{f(x)}{x}$$

exercice: 3

Sachant que

$$\sum_{n \geq 1} \frac{1}{n^2} = \frac{\pi^2}{6}$$

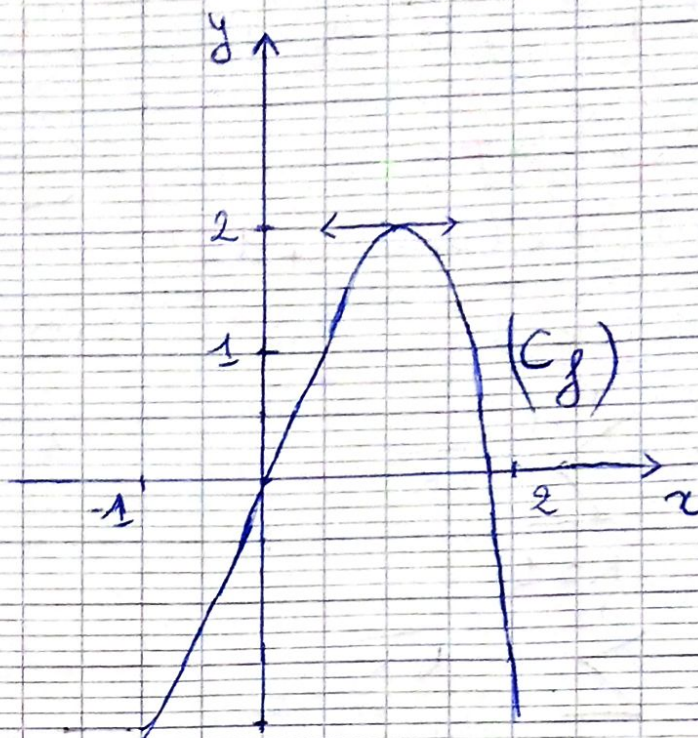determinér $\displaystyle\sum_{n \geq 1} \frac{1}{(2n-1)^2}$

exercice: 4

$$\lim_{x \to 0} \frac{x \, tg 2x - 2x \, tg x}{(1 - \cos 2x)^2} = ?$$

exercice: 5

$$g(x) = \frac{f(x)}{x^2} \; ; \; g'(1) = ?$$

exercice: 6

$$(u_n)_{n \geq 2} : u_n = \sum_{k=1}^{n} \frac{k}{1 - n^2}$$

$$\lim_{+\infty} u_n = ?$$

exercice: 7

$0 < k < 1$ alors

$$\lim_{+\infty} \prod_{p=0}^{n} \left(1 + k^{2^p}\right) = ?$$

exercice: 8

$M = \begin{pmatrix} a & b \\ c & d \end{pmatrix} \in M_2(\mathbb{R})$

avec $b \neq 0$

$M^3 = I_2$ alors $a + d = ?$

exercice: 9

$$U_n = \sum_{K=1}^{n} \sqrt{K}$$

$$\vartheta_n = \sum_{K=1}^{n} \frac{\sqrt{K}}{1 + \sqrt{1 + \frac{1}{K}}}$$

$S_n = U_n + \vartheta_n$ alors

$S_n = ?$

exercice: 10

$$\frac{2^3 - 1}{2^3 + 1} * \frac{3^3 - 1}{3^3 + 1} \times \cdots \times \frac{2022^3 - 1}{2022^3 + 1}$$

exercice: 11

$$\sum_{K=1}^{n} \frac{K}{K^4 + K^2 + 1} = ?$$

exercice: 12

$$\sum_{K=2}^{n} \frac{K^2 + 1}{K^2 - 1} = ?$$

exercice: 13

$$\frac{3}{1! + 2! + 3!} + \cdots + \frac{n + 2}{(n)! + (n+1)! + (n+2)!} = ?$$

exercice: 14

a, b et $c \in \mathbb{R} /$

$$\frac{a}{b+c} + \frac{c}{b+a} + \frac{b}{a+c} = 1$$

alors $\dfrac{a^2}{b+c} + \dfrac{c^2}{b+a} + \dfrac{b^2}{a+c} = ?$

exercice: 15

$P(x) = 1 - 24x + 3x^2 + x^3$

$P(\alpha) = 0$; $P(\beta) = 0$ et

$P(\gamma) = 0$

$\sqrt[3]{\alpha} + \sqrt[3]{\beta} + \sqrt[3]{\gamma} = ?$

Exercice : 16

$$\sin(a) + \sin(b) = n$$

$$\cos(a) + \cos(b) = m$$

$$\sin(a+b) = ?$$

Exercice : 17

$$\frac{bc}{a} = 1 \; ; \; \frac{ac}{b} = 3 \text{ et } \frac{ab}{c} = 4$$

$$a^2 + b^2 + c^2 = ?$$

Exercice : 18

ABC est un $\triangle$

$E = B * C$; $\mathscr{C}$ le cercle circonscrit au $\triangle$ ABC soit

$$D = (AE) \cap (\mathscr{C})$$

$AC = 6$ et $CD = 6$

alors $BC = ?$

Exercice : 19

$$\left(1 + \frac{\sqrt{2} + \sqrt{3} + \sqrt{4}}{\sqrt{2} + \sqrt{3} + \sqrt{6} + \sqrt{8} + 4} \right)^{10}$$

$$= ?$$

Exercice : 20

$$\lim_{x \to a} \; (a^2 - x^2) \, tg \, \frac{\pi x}{2a} = ?$$

Exercice : 21

$$\lim_{x \to 0} \left(\frac{1}{2(1 - \cos(x))} - \frac{1}{\sin^2(x)} \right) = ?$$

Exercice : 22

Determiner les primitives de

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