

L1P: TE 1: 3D et fonctions exp/log

EXERCICE 1

$$d: \begin{cases} x = 1 - \alpha \\ y = -2 + 3\alpha \\ z = 4 + 2\alpha \end{cases}$$

$$A(2; -3; 0) \quad B(-5; 1; 1) \quad C(-4; -3; 5) \in \Pi$$

$$\vec{AB} = \begin{pmatrix} -7 \\ 4 \\ 1 \end{pmatrix} \quad \vec{AC} = \begin{pmatrix} -6 \\ 0 \\ 5 \end{pmatrix}$$

$$\vec{AB} \wedge \vec{AC} = \begin{pmatrix} -7 \\ 4 \\ 1 \end{pmatrix} \wedge \begin{pmatrix} -6 \\ 0 \\ 5 \end{pmatrix} = \begin{pmatrix} 20 \\ 6 \\ 24 \end{pmatrix} \parallel \begin{pmatrix} 10 \\ 3 \\ 12 \end{pmatrix}$$

$$\Pi: 10x + 3y + 12z + d = 0$$

$$A: 20 - 9 + d = 0 \Rightarrow d = -11$$

$$\Pi: 10x + 3y + 12z - 11 = 0$$

$$d \rightarrow \Pi: 10(1 - \alpha) + 3(-2 + 3\alpha) + 12(4 + 2\alpha) - 11 = 0 \Leftrightarrow$$

$$\Leftrightarrow 10 - 10\alpha - 6 + 9\alpha + 48 + 24\alpha - 11 = 0$$

$$\Leftrightarrow 23\alpha = -41 \Rightarrow \alpha = -\frac{41}{23} \quad \rightarrow \text{seuants}$$

$$I \left(1 + \frac{41}{23}; -2 + \frac{3 \cdot 41}{23}; 4 - \frac{2 \cdot 41}{23} \right) \Rightarrow I \left(\frac{64}{23}; -\frac{63}{11}; \frac{10}{23} \right)$$

EXERCICE 2

$$\begin{aligned} 1) \log(\sqrt[3]{a^2 \cdot \sqrt{bc^3}}) &= \frac{1}{3} \log(a^2 \sqrt{bc^3}) = \frac{1}{3} (2 \log a + \frac{1}{2} \log(bc^3)) = \\ &= \frac{1}{3} (2 \log a + \frac{1}{2} \log b + \frac{3}{2} \log c) = \\ &= \frac{2}{3} \log a + \frac{1}{6} \log b + \frac{1}{2} \log c \end{aligned}$$

$$\begin{aligned} 2) \log\left(\frac{3ab^2c^4}{\sqrt[5]{a^3}}\right) &= \log(3ab^2c^4) - \log(a^{3/5}) = \\ &= \log 3 + \log a + 2 \log b + 4 \log c - \frac{3}{5} \log a = \\ &= \log 3 + 2 \log b + 4 \log c - \frac{2}{5} \log a \end{aligned}$$

EXERCICE 3

$$1) -\log_4 8 - \log_4(32) = \log_4 \frac{1}{8 \cdot 32} = \log_4 \frac{1}{256} = \log_4 4^{-4} = -4$$

$$\begin{aligned} 2) \log 50 + \log 125 - 2 \log 25 &= \log\left(\frac{50 \cdot 125}{25^2}\right) = \log\left(\frac{6250}{625}\right) = \\ &= \log 10 = 1 \end{aligned}$$

$$3) \log_m \left(\frac{1}{m^4} \right) = \log_m m^{-4} = -4$$

$$4) \log_{m^5} (m^3) = \frac{\log_m m^3}{\log_m m^5} = \frac{3}{5}$$

$$5) \log_m (\sqrt[3]{m^5}) = \log_m m^{\frac{5}{3}} = \frac{5}{3}$$

EXERCISE 4

$$f(x) = \frac{1}{\ln(-2x+8)}$$

$$\bullet -2x+8 > 0 \Leftrightarrow 8 > 2x \Leftrightarrow x < 4$$

$$\bullet \ln(-2x+8) \neq 0 \Leftrightarrow -2x+8 \neq 1 \Leftrightarrow -2x \neq -7 \Leftrightarrow x \neq \frac{7}{2}$$



$$D_f =]-\infty; \frac{7}{2}[\cup]\frac{7}{2}; 4[$$