Nom: Nefissa / horma / EL Moctar salem

Exemple: 1

exprimer en fonction de $\ln 2, \ln 3$ et $\ln 5$

- $A = \ln\left(\sqrt{\frac{9}{25}}\right)$; • $B = \ln(3\sqrt{15})$;

- $C = \ln\left(\sqrt{\frac{1}{75}}\right)$;

- $D = \ln\frac{1}{2} + \ln\left(\frac{2}{3}\right) + \ln\left(\frac{3}{4}\right) + \cdots + \ln\left(\frac{99}{100}\right)$

- $E = \ln(1000)$; $F = \ln(0,02)$.

Solution:

- $A = \ln\left(\sqrt{\frac{9}{25}}\right) = \ln\left(\frac{3}{5}\right)$

$$\Rightarrow \boxed{A = \ln 3 - \ln 5}$$

- $B = \ln(3\sqrt{15}) = \ln 3 + \ln\sqrt{15}$

$\quad = \ln 3 + \frac{1}{2}(\ln 3 + \ln 5)$

$\quad = \ln 3 + \frac{1}{2}\ln 3 + \frac{1}{2}\ln 5$

$$\boxed{B = \frac{3}{2}\ln 3 + \frac{1}{2}\ln 5}$$

- $C = \ln\left(\sqrt{\frac{1}{75}}\right) = +\frac{1}{2}\left(\frac{1}{75}\right)$

$\quad = -\frac{1}{2}\ln(75) = -\frac{1}{2}\ln(25\times 3)$

$\quad = -\frac{1}{2}(\ln 25 + \ln 3) = -\frac{1}{2}(\ln 5^2 + \ln 3)$

$$\Rightarrow \boxed{C = -\ln 5 - \frac{1}{2}\ln 3}$$

- $D = \ln\frac{1}{2} + \ln\left(\frac{2}{3}\right) + \ln\left(\frac{3}{4}\right) + \cdots + \ln\left(\frac{99}{100}\right)$

(M₁):

$D = \ln 1 - \ln 2 + \ln 2 - \ln 3 + \ln 3 - \ln 4 + / \cdots$

$\quad + \ln 99 - \ln 100 = -\ln 100$

$\quad = -\ln 10^2 = -2\ln 10$

$\quad = -2\ln(5\times 2) = -2(\ln 5 + \ln 2)$

$$\Rightarrow \boxed{D = -2\ln 5 - 2\ln 2}$$

(M₂)

$D = \ln\left[\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \cdots \times \frac{98}{99} - \frac{99}{100}\right]$

$$\boxed{D = -\ln 100}$$

- $E = \ln(1000) = \ln 10^3 = 3\ln 10$

$\quad = 3\ln(2\times 5) = 3(\ln 2 + \ln 5)$

$$\Rightarrow \boxed{E = 3\ln 2 + 3\ln 5}$$

- $F = \ln(0,02) = \ln(2\cdot 10^{-2})$

$\quad = \ln 2 + \ln 10^{-2} = \ln 2 - 2\ln 2 - 2\ln 5$

$$\boxed{F = -\ln 2 - 2\ln 5}$$

Ecoles privés Elmaarif

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