Equation :

f) $2\ln(x-4) = \ln x - 2\ln 2$

- $x \in D_6 \Leftrightarrow \begin{cases} x-4>0 \\ x>0 \end{cases} \Leftrightarrow \begin{cases} x>4 \\ x>0 \end{cases} \Leftrightarrow x>4$

$$\boxed{D_6 =]4, +\infty[}$$

- $x \in D_6 \Leftrightarrow \ln(x-4)^2 = \ln x - \ln 4$

$\Rightarrow \ln(x-4)^2 = \frac{x}{4}$

$\Rightarrow 4(x-4)^2 = x$

$\Rightarrow 4(x^2 - 8x + 16) = x$

$\Rightarrow 4x^2 - 32x + 64 - x = 0$

$\Rightarrow 4x^2 - 33x + 64 = 0$

- $\Delta = 65$

* $x_1 = \frac{33+\sqrt{65}}{8} > 4 \Rightarrow x \in D_6$

* $x_2 = \frac{33-\sqrt{65}}{8} < 4 \Rightarrow x_2 \notin D_6$

$$S = \left\{ \frac{33+\sqrt{65}}{8} \right\}$$

* Aicha yahyaoufdhallah

ELMAARIF

2018-2019

Logarithmes

Exemples

- **Resoudre**

e) $\ln(x+3) + \ln(x+5) = \ln 15$

f) $2\ln(x-4) = \ln x - 2\ln 2$.

Solutions

Equations

e) $\ln(x+3) + \ln(x+5) = \ln 15$

- $x \in D_5 \Leftrightarrow \begin{cases} x+3>0 \\ x+5>0 \end{cases} \Leftrightarrow \begin{cases} x>-3 \\ x>-5 \end{cases} \Leftrightarrow x>-3$

$$\Leftrightarrow \boxed{D_5 =]-3, +\infty[}$$

- $x \in D_5 \Rightarrow \ln[(x+3)(x+5)] = \ln 15$

$\Rightarrow (x+3)(x+5) = 15$

$\Rightarrow x^2 + 5x + 3x + 15 = 15$

$\Rightarrow x^2 + 8x = 0$

$\Rightarrow x(x+8) = 0$

- $x = 0 \in D_5$ accepter.
- $x + 8 = 0 \Rightarrow x = -8 \notin D_5$ rejeter

$$S = \{0\}$$