

تمارين حول الدوال اللوغاريتمية

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التمرين (3)

$$\underline{f(x) = \sqrt{\ln(x-3)} \bullet}$$

$$\begin{aligned} D_f &= \{x \in \mathbb{R} / x-3 > 0\} \cap \{x \in \mathbb{R} / \ln(x-3) \geq 0\} \\ &= \{x \in \mathbb{R} / x > 3\} \cap \{x \in \mathbb{R} / x-3 \geq 1\} \\ &= \{x \in \mathbb{R} / x > 3\} \cap \{x \in \mathbb{R} / x \geq 4\} \\ &= [4; +\infty[ \end{aligned}$$

$$\underline{g(x) = \sqrt{-\ln(x)+2} \bullet}$$

$$\begin{aligned} D_g &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / -\ln(x)+2 \geq 0\} \\ &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / \ln(x) \leq \ln(e^2)\} \\ &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / x \leq e^2\} \\ &= ]0; +\infty[ \cap ]-\infty; e^2] \\ &= ]0; e^2] \end{aligned}$$

$$\underline{h(x) = \frac{\ln(x)}{\ln(x)-1} \bullet}$$

$$\begin{aligned} D_h &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / \ln(x)-1 \neq 0\} \\ &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / \ln(x) \neq \ln(e)\} \\ &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / x \neq e\} \\ &= ]0; e[ \cup ]e; +\infty[ \end{aligned}$$

$$\underline{i(x) = \ln|\ln(x)-1| \bullet}$$

$$\begin{aligned} D_i &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / \ln(x)-1 \neq 0\} \\ &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / \ln(x) \neq \ln(e)\} \\ &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / x \neq e\} \\ &= ]0; e[ \cup ]e; +\infty[ \end{aligned}$$

$$\underline{j(x) = \ln(2x - 5)^2 \bullet}$$

$$\begin{aligned} D_j &= \{x \in \mathbb{R} / 2x - 5 \neq 0\} \\ &= \left\{x \in \mathbb{R} / x \neq \frac{5}{2}\right\} \\ &= \left]-\infty; \frac{5}{2}[\cup \left]\frac{5}{2}; +\infty\right[ \end{aligned}$$

$$\underline{k(x) = 2 \ln(2x - 5) \bullet}$$

$$\begin{aligned} D_k &= \{x \in \mathbb{R} / 2x - 5 > 0\} \\ &= \left\{x \in \mathbb{R} / x > \frac{5}{2}\right\} \\ &= \left]\frac{5}{2}; +\infty\right[ \end{aligned}$$

$$\underline{l(x) = \sqrt{\ln^2(x) - \ln(x)} \bullet}$$

$$\begin{aligned} D_l &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / \ln^2(x) - \ln(x) \geq 0\} \\ &= \{x \in \mathbb{R} / x > 0\} \cap \{x \in \mathbb{R} / \ln(x)(\ln(x) - 1) \geq 0\} \\ &= ]0; +\infty[ \cap (]0; 1] \cup [e; +\infty[) \\ &= ]0; 1] \cup [e; +\infty[ \end{aligned}$$

$$\underline{m(x) = \frac{\sqrt{\ln(1-x)}}{x} \bullet}$$

$$\begin{aligned} D_m &= \{x \in \mathbb{R} / 1 - x > 0\} \cap \{x \in \mathbb{R} / \ln(1-x) \geq 0\} \cap \mathbb{R}^* \\ &= \{x \in \mathbb{R} / x < 1\} \cap \{x \in \mathbb{R} / 1 - x \geq 1\} \cap \mathbb{R}^* \\ &= \{x \in \mathbb{R} / x < 1\} \cap \{x \in \mathbb{R} / x \leq 0\} \cap \mathbb{R}^* \\ &= ]-\infty; 0[ \end{aligned}$$