

تمارين حول الدوال الأسية sajid mohammed

التمرين (1)

$$e^{2x} - 2e^{x-1} = 0 \bullet$$

لكل  $x$  من  $\mathbb{R}$  :

$$e^{2x} - 2e^{x-1} = 0 \Leftrightarrow (e^x)^2 - 2e^x \times e^{-1} = 0$$

$$\Leftrightarrow e^x(e^x - 2e^{-1}) = 0$$

$$\Leftrightarrow (e^x - 2e^{-1}) = 0$$

$$\Leftrightarrow e^x = 2e^{-1}$$

$$\Leftrightarrow x = \ln(2e^{-1})$$

$$\Leftrightarrow x = \ln(2) - 1$$

إذن  $S = \{\ln(2) - 1\}$

$$e^{2x} + 3e^x - 4 = 0 \bullet$$

لكل  $x$  من  $\mathbb{R}$  :

$$e^{2x} + 3e^x - 4 = 0 \Leftrightarrow (e^x)^2 + 3e^x - 4 = 0$$

$$\Leftrightarrow (e^x + 4)(e^x - 1) = 0$$

$$\Leftrightarrow (e^x - 1) = 0$$

$$\Leftrightarrow e^x = 1$$

$$\Leftrightarrow x = 0$$

إذن  $S = \{0\}$

$$e^x - 8 + 15e^{-x} = 0 \bullet$$

لكل  $x$  من  $\mathbb{R}$  :

$$e^x - 8 + 15e^{-x} = 0 \Leftrightarrow (e^x)^2 - 8e^x + 15 = 0$$

$$\Leftrightarrow (e^x - 5)(e^x - 3) = 0$$

$$\Leftrightarrow e^x = 5 \text{ ou } e^x = 3$$

$$\Leftrightarrow x = \ln(5) \text{ ou } x = \ln(3)$$

إذن  $S = \{\ln(5); \ln(3)\}$

$$\frac{e^{-2x+1} - 2}{e^x - 4} = \frac{1}{2} \bullet$$

$$D = \{x \in \mathbb{R} / e^x - 4 \neq 0\}$$

لتكن  $D$  مجموعة تعريف المعادلة :

$$= \{x \in \mathbb{R} / e^x \neq 4\}$$

$$= \{x \in \mathbb{R} / x \neq \ln(4)\}$$

لكل  $x \neq \ln(4)$  لدينا:

$$\frac{e^{-2x+1} - 2}{e^x - 4} = \frac{1}{2} \Leftrightarrow \frac{2e^{-2x} \times e - 4 - e^x + 4}{2(e^x - 4)} = 0$$

$$\Leftrightarrow \frac{2e - e^{3x}}{2(e^x - 4)e^{2x}} = 0$$

$$\Leftrightarrow e^{3x} = 2e$$

$$\Leftrightarrow x = \frac{\ln(2) + 1}{3}$$

$$S = \left\{ \frac{\ln(2) + 1}{3} \right\} \text{ إذن}$$

$$\boxed{\frac{e^x}{e^{-2}} + \sqrt{\frac{1}{e^{2x-4}}} = 2e^2 \bullet}$$

لكل  $x$  من  $\mathbb{R}$  لدينا :

$$\frac{e^x}{e^{-2}} + \sqrt{\frac{1}{e^{2x-4}}} = 2e^2 \Leftrightarrow e^{x+2} + \frac{1}{e^{x-2}} - 2e^2 = 0$$

$$\Leftrightarrow \frac{e^{2x} + 1 - 2e^x}{e^{x-2}} = 0$$

$$\Leftrightarrow e^{2x} + 1 - 2e^x = 0$$

$$\Leftrightarrow (e^x - 1) = 0$$

$$\Leftrightarrow e^x = 1$$

$$\Leftrightarrow x = 0$$

$$S = \{0\} \text{ إذن}$$

$$\boxed{\left| e^{\frac{3}{x}-1} - 5 \right| = 1 \bullet}$$

لكل  $x$  من  $\mathbb{R}^*$  لدينا :

$$S = \left\{ \frac{3}{\ln(6)+1}; \frac{3}{\ln(4)+1} \right\} \text{ إذن}$$

$$\left| e^{\frac{3}{x}-1} - 5 \right| = 1 \Leftrightarrow e^{\frac{3}{x}-1} - 5 = 1 \text{ ou } e^{\frac{3}{x}-1} - 5 = -1$$

$$\Leftrightarrow \frac{3}{x} - 1 = \ln(6) \text{ ou } \frac{3}{x} - 1 = \ln(4)$$

$$\Leftrightarrow \frac{3}{x} = \ln(6) + 1 \text{ ou } \frac{3}{x} = \ln(4) + 1$$

$$\Leftrightarrow x = \frac{3}{\ln(6)+1} \text{ ou } x = \frac{3}{\ln(4)+1}$$

$$\boxed{\ln\left(e^{\frac{x^2}{2}}\right) - e^{\ln\left(\frac{x}{2}\right)} = \frac{x}{2} \bullet}$$

لكل  $x > 0$  لدينا :

$$\ln\left(e^{\frac{x^2}{2}}\right) - e^{\ln\left(\frac{x}{2}\right)} = \frac{x}{2} \Leftrightarrow \frac{x^2}{2} - \frac{x}{2} = \frac{x}{2}$$

$$S = \{2\}$$

إذن

$$\Leftrightarrow \frac{x^2 - 2x}{2} = 0$$

$$\Leftrightarrow x^2 - 2x = 0$$

$$\Leftrightarrow x = 2$$