N. 90

$$4\cdot\left(\frac{3}{2}\right)^{2x} + 15\left(\frac{3}{2}\right)^{-x} = 19 \qquad \left(\frac{3}{2}\right)^{x} = t$$

$$4t^2 + \frac{15}{t} = 19$$

$$4t^3 + 15 - 19t = 0$$

	4	0	-19	15
1		+4	+4	-15
	4	+4	-15	0

$$(4t^2 + 4t - 15)(t - 1) = 0$$

$t_1 = 1 \Longrightarrow \left(\frac{3}{2}\right)^x = 1$

$\Longrightarrow x = 0$

$$t_{1,2} = \frac{-4 \pm \sqrt{16 - 4(4)(15)}}{8} = \frac{-4 \pm 16}{8} \begin{cases} -\frac{5}{2} \\ \frac{3}{2} \end{cases}$$

$t_2 = -\frac{5}{2} \Longrightarrow$

$\left(\frac{3}{2}\right)^x = -\frac{5}{2}$ impos.

$(\underline{3})^x = \underline{3} \qquad x = 1$

Nº 97

$$e^{\frac{3x+8}{2}} - e^{\frac{x+2}{2}} + e^{x+3} - 1 = 0 \qquad e^{\frac{x}{2}} = t$$

$$e^{3\frac{x}{2}} \cdot e^4 - e^{\frac{x}{2}} \cdot e + e^x \cdot e^3 - 1 = 0$$

$$e^4 t^3 - e \cdot t + e^3 t^2 - 1 = 0$$

$$e^3 t^2 (et + 1) - 1 (et + 1) = 0$$

$$(et+1)(e^3 t^2 - 1) = 0$$

$t = -\frac{1}{e} \rightarrow$ impossibile

$t = \sqrt{\frac{1}{e^3}}$

$t = -\sqrt{\frac{1}{e^3}}$ imp.

$$t = \sqrt{\frac{1}{e^3}}$$

$$\sqrt{\frac{1}{e^3}} = \left(e^{-3}\right)^{\frac{1}{2}} = e^{-\frac{3}{2}}$$

$$e^{\frac{x}{2}} = e^{-\frac{3}{2}}$$

$$\frac{x}{2} = -\frac{3}{2} \qquad \boxed{x = -3}$$

N° 138

$$\frac{2^{x}}{2^{2x-1}} - 8\sqrt{2^{x^2-3}} < 0$$

$$2^{x-2x+1} < 2^{3} \cdot \left(2^{x^2-3}\right)^{\frac{1}{2}}$$

$$2^{1-x} < 2^{3+\frac{x^2-3}{2}}$$

$$2^{1-x} < 2^{\frac{3+x^2}{2}}$$

la base è $> 1 \Rightarrow 1-x < \frac{3+x^2}{2}$

$$2-2x-3-x^2 < 0$$

$x^2+2x+1 > 0 \quad (x+1)^2 > 0$ sempre $x \neq -1$