

Pag 610 in avanti

142: $2^x = 16 \cdot \sqrt{2}$

$$2^x = 2^4 \cdot 2^{1/2}$$

$$2^x = 2^{\frac{9}{2}} \xrightarrow{\text{inj}} x = \frac{9}{2}$$

146: $\sqrt[3]{5^x} = \frac{1}{3125}$

$$5^{\frac{x}{3}} = 5^{-5}$$

$$\xrightarrow{\text{inj}} \frac{x}{3} = -5 \rightsquigarrow x = -15$$

154: $2^x + 9 \cdot 2^x = 40$

$$10 \cdot 2^x = 40$$

$$2^x = 4 \rightsquigarrow x = 2$$

155: $3 \cdot 4^x + \frac{7}{4} 4^x = 19\sqrt{2}$ $4^y = t$

$$3t + \frac{7}{4}t = 19\sqrt{2} \rightsquigarrow \frac{19}{4}t = 19\sqrt{2} \rightsquigarrow t = \frac{19\sqrt{2}}{19} \cdot 4$$

$$\rightsquigarrow 4^x = 4\sqrt{2} \rightsquigarrow 2^{2x} = 2^2 \cdot 2^{1/2} \rightsquigarrow 2^{2x} = 2^{\frac{5}{2}} \rightsquigarrow x = \frac{5}{4}$$

160: $3 \cdot 5^x + 5^{x+1} = 8 \cdot 5^3$

$$3 \cdot 5^x + 5 \cdot 5^x = 8 \cdot 5^3 \rightsquigarrow 8 \cdot 5^x = 8 \cdot 5^3 \rightsquigarrow 5^x = 5^3 \xrightarrow{\text{inj}} x = 3$$

161: $3^x - 3^{x-2} + 3^{x+1} = 35$

$$3^x (1 - 3^{-2} + 3) = 35 \quad \rightarrow \quad 1 - \frac{1}{9} + 3 = \frac{35}{9}$$

$$3^x \cdot \frac{35}{9} = 35 \rightsquigarrow 3^x = 9 \xrightarrow{\text{inj}} x = 2$$

176: $4^{2x-1} - 4^{2x+1} + 3 \cdot 2^{4x} = -\frac{3}{2}$

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

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

$$2^{4x} \left(\frac{1}{4} - 4 + 3 \right) = -\frac{3}{2} \rightsquigarrow 2^{4x} \left(-\frac{3}{4} \right) = -\frac{3}{2} \rightsquigarrow 2^{4x} = 2 \rightsquigarrow x = \frac{1}{4}$$

$$\underline{184}: 4^{x+1} = 3^{x+1} \quad \left(\frac{4}{3}\right)^{x+1} = 1 = \left(\frac{4}{3}\right)^0 \quad \text{inf} \quad x+1=0 \quad x=-1$$

$$\underline{214}: 2^{3x} + 8^x = \sqrt[5]{2^0} \quad 2^{3x} + 2^{3x} = 2^{\frac{1}{5}} \quad 2^{3x} = t$$

$$\leadsto 2t = 2^{\frac{1}{5}} \quad \leadsto t = \frac{2^{\frac{1}{5}}}{2} = 2^{\frac{1}{5}-1} = 2^{-\frac{4}{5}}$$

$$2^{3x} = 2^{-\frac{4}{5}} \quad \text{inf} \quad 3x = -\frac{4}{5} \quad \leadsto x = -\frac{4}{15}$$

$$\underline{225}: \left[\left(\frac{3}{2}\right)^x\right]^{-2} \cdot \frac{9}{\sqrt{2}} = \frac{4}{\sqrt{3}}$$

$$\left(\frac{2}{3}\right)^{2x} \cdot \frac{3^2}{2^{\frac{1}{2}}} = \frac{2^2}{3^{\frac{1}{2}}} \quad \leadsto \frac{2^{2x}}{3^{2x}} \cdot \frac{3^2}{2^{\frac{1}{2}}} \cdot \frac{3^{\frac{1}{2}}}{2^2} = 1$$

$$\frac{2^{2x-\frac{1}{2}-2}}{3^{2x-2-\frac{1}{2}}} = 1 \quad \leadsto \left(\frac{2}{3}\right)^{2x-\frac{1}{2}-2} = \left(\frac{2}{3}\right)^0$$

$$\leadsto 2x - \frac{1}{2} - 2 = 0 \quad \leadsto x = \frac{5}{4}$$

$$\underline{226} \quad (24^x)^{x-4} = \frac{1}{3(3^{4x})^2}$$

$$(3^{3x})^{x-4} = \frac{1}{3^{8x+1}} = 3^{-(8x+1)}$$

$$3^{3x^2-12x} = 3^{-8x-1} \quad \text{inf} \quad 3x^2-12x = -8x-1$$

$$3x^2 - 4x + 1 = 0$$

$$3x(x-1) - (x-1) = 0 \quad (3x-1)(x-1) = 0$$

$$x=1$$

$$x=\frac{1}{3}$$

243: $10^x - 2^x - 5^x + 1 = 0$

$$5^x \cdot 2^x - 2^x - 5^x + 1 = 0$$

$$xt - t - x + 1 = 0$$

$$t(x-1) - 1(x-1) = 0$$

$$(x-1)(t-1) = 0$$

$$(5^x - 1)(2^x - 1) = 0$$

$$5^x - 1 = 0 \quad \leadsto \quad x = 0$$

$$2^x - 1 = 0 \quad \leadsto \quad x = 0$$