

ESERCIZI ESPONENZIALI

Risolvere le seguenti equazioni e disequazioni:

$$1. \quad 3^x - 9 \cdot \frac{\sqrt{3}}{\sqrt[5]{9}} = 0, \quad 3^x - 3^2 \frac{3^{\frac{1}{2}}}{3^{\frac{2}{5}}} = 0 \Rightarrow 3^x = 3^2 \frac{3^{\frac{1}{2}}}{3^{\frac{2}{5}}} = 3^{2 + \frac{1}{2} - \frac{2}{5}} = 3^{\frac{20+5-4}{10}} = 3^{\frac{21}{10}} \Rightarrow 3^x = 3^{\frac{21}{10}} \Rightarrow x = \frac{21}{10}$$

$$2. \quad 8^{x-1} = \sqrt[3]{2^{x-3}} \quad x = \frac{3}{4},$$

$$3. \quad \left(\frac{1}{2}\right)^{2x} - \frac{12}{2^x} + 32 = 0 \quad x = -3; \quad x = -2,$$

$$4. \quad \frac{\sqrt{3 \cdot \sqrt{9^x}}}{81^{x-1}} = 9^{1+2x} \quad x = \frac{1}{3}$$

$$5. \quad \frac{5^x}{5^x + 1} - \frac{1}{25^x - 1} = 1 \quad \emptyset,$$

$$6. \quad \begin{cases} 36 \cdot 6^{x-y} = 6^{2x} \\ 49^x \cdot \sqrt{7^y} = 1 \end{cases} \quad \begin{matrix} x = -\frac{2}{3} \\ y = \frac{8}{3} \end{matrix},$$

$$7. \quad a) 3^{x+1} - \frac{3^x}{9} + 3^x = 35 \quad x = 2,$$

$$b) 9^x + 2 \cdot 3^{x+1} - 27 \geq 0 \quad x \geq 1$$

$$8. \quad (4^{x-1})^{x+1} = 8^{x^2-2} \quad x = 2; \quad x = -2,$$

$$9. \quad a) 2 \cdot 3^x - 9^x = 1 \quad x = 0, \\ 4^x + 3 \cdot 2^x + 2 > 0 \quad \forall x,$$

$$10. \quad \frac{2^{2x}}{1+2^x} = 1 - \frac{2^x}{2^x+1} \quad x = 0.$$

$$11. \quad |3^x - 3| > 6 \quad x > 2$$

$$12. \quad 2^{2x+2} - 3 \cdot 2^x - 1 = 0 \quad x = 0$$

$$13. \quad 7^{\frac{x}{2}} \cdot 7^{-\frac{1}{2}} \cdot 7^3 = \sqrt{7^3 \sqrt{7}} \quad x = -\frac{11}{3}$$

$$14. \quad (3^{2x-1})^x = 81^{\frac{1-x}{2}} \quad x = 1; \quad x = -2$$