

Antworten

- 1) $4+x^3=3x^3-12$ $2x^3=16 \rightarrow x^3=8 \rightarrow x=2$
- 2) $4x^3-8x^2-12x=0$ $x(4x^2-8x-12)=0$ $4x(x-3)(x+1)=0$ $x=0, 3, -1$
- 3) $100=4 \cdot (x-3)^4$ $(x-3)^4=25 \rightarrow x=3 \pm \sqrt[4]{25}$
- 4) $\frac{4x-3}{x}=2$ $2x=4x-3 \rightarrow x=1\frac{1}{2}$
- 5) $\frac{2x+2}{x}=\frac{x}{x-1}$ $2x^2+2x-2x-2=x^2 \Rightarrow x^2=2 \rightarrow x=\pm\sqrt{2}$
- 6) $\frac{1}{2}=\frac{x}{6}$ $x=3$
- 7) $4x^2-8=16$ $4x^2=24 \rightarrow x=\pm\sqrt{6}$
- 8) $x-\frac{12}{x}=1$ $x-1=\frac{12}{x}$ $x^2-x=12 \rightarrow x=\frac{1}{2} \text{ oder } x=-3$
- 9) $2x-1=\frac{10}{x}$ $2x^2-x=10 \rightarrow 2x^2-x-10=0$ $\frac{1 \pm \sqrt{1+80}}{4} = \frac{1 \pm 9}{4} = -2 \text{ oder } \frac{5}{2}$
- 10) $3x^5=20x^2$ $x=0$ $x^3=\frac{20}{3} \rightarrow x=\sqrt[3]{\frac{20}{3}}$
- 11) $3^{x+2}=16$ $x+2=\log_3 16 \rightarrow x=-2+\log_3 16$
- 12) $3^{4x+17}=3^2$ $4x+17=2 \rightarrow x=-\frac{15}{4}$
- 13) $3\sqrt{x^2+1}=18$ $x^2+1=36 \rightarrow x=\pm\sqrt{35}$
- 14) $13-\sqrt{-2x+6}=4$ $9=\sqrt{-2x+6} \rightarrow 81=-2x+6 \rightarrow x=-37\frac{1}{2}$
- 15) $^2\log(2x-3)=3$ $2x-3=8$ $x=5\frac{1}{2}$
- 16) $32\sqrt{2}=(\frac{1}{2})^{2x}$ $2^{\frac{5}{2}}=2^{-2x} \rightarrow x=-2,75$
- 17) $^3\log(x)+3=7$ $3^4=x \rightarrow x=81$
- 18) $100 \cdot 0,9^x=150 \cdot 0,6^x$ $0,9^x=1,5 \cdot 0,6^x \rightarrow (\frac{1}{2})^x=1,5 \rightarrow x=1$
- 19) $2\sqrt{x^2+7}=-x+5$ $4(x^2+7)=x^2-10x+25$ $3x^2+10x+3=0$
 $x=\frac{-10 \pm \sqrt{100-36}}{6}$
 $=\frac{-10 \pm 8}{6} = -3 \text{ oder } -\frac{1}{3}$
- 20) $^2\log(x)+3=^2\log(x+16)$ $\delta x=x+16$
- 21) $\frac{4x-6}{x^2-6x}=0$ $x=\frac{1}{2}$ $x=\frac{1}{2}$
- 22) $x \cdot \frac{x+1}{x+2}=1$ $x^2+x=x+2 \rightarrow x=\pm\sqrt{2}$
- 23) $(x^2+2x+1) \cdot x^{-1}=0$ $x^2+2x+1=0$ $x=-1$
- 24) $\frac{12+2x}{x^2}=2$ $2x^2=12+2x$ $x^2-x-6=0$ $x=3 \text{ oder } -2$
- 25) $4 \cdot (^2\log(x))^2+16=28$ $(^2\log(x))^2=3$ $^2\log x=\pm\sqrt{3}$ $x=2^{\pm\sqrt{3}}$

a) 0

$$26) 2ax^2 + 4ax = 40a \quad 2a(x^2 + 2x - 20) = 0 \quad \frac{-2 \pm \sqrt{4 + 80}}{2} = \frac{-2 \pm \sqrt{84}}{2}$$

$$27) 3x^2 - 5ax = 0 \quad x(3x - 5a) = 0 \quad x = 0 \quad x = \frac{5a}{3}$$

$$28) 3(x-a)^3(x^2-a) = 0 \quad x = a \text{ u. } x = \pm \sqrt{a}$$

$$29) (x-4)^2 + 3(x-4) = 10 \quad p^2 + 3p - 10 = 0 \quad p = -5 \quad p = 2 \quad x-4 = -5 \quad x-4 = 2$$

$$30) x(x-2) \cdot 5 - 5(x-1)(x+4) = 0 \quad 5x^2 - 10x - 5(x^2 + 3x - 4) = 0 \quad x = -1 \quad x = 6$$

$$31) (\sin(x))^2 - 0,5 \sin(x) - 0,5 = 0 \quad p^2 - 0,5p - 0,5 = 0 \quad -25x + 20 = 0 \quad x = \frac{4}{5}$$

$$32) \left(\frac{4}{x}\right)^3 - 2 \cdot \left(\frac{4}{x}\right) = 0 \quad \left(\frac{4}{x}\right)^2 - 2 = 0 \quad p = 1 \text{ of } p = -0,5 \quad x = 1 \text{ of } x = -0,5$$

$$33) 2(x^2-1)^4 = 8 \quad \left(\frac{4}{x}\right)^2 = 4 \quad \left(\frac{4}{x}\right) = \pm \sqrt{2} \quad x = \frac{4}{\pm \sqrt{2}} = \pm 2\sqrt{2}$$

$$34) \frac{12}{\sqrt{2+x}} - \sqrt{x+2} = 1 \quad 12 - (x+2) = \sqrt{2+x} \quad 10 - x = \sqrt{2+x} \quad 100 - 20x + x^2 = 2 + x$$

$$35) 2x \cdot \frac{1}{2} \cdot (9-x^2)^{-0,5} - 2x + 2\sqrt{9-x^2} = 0 \quad x^2 - 21x + 98 = 0 \quad (x-7)(x-14) = 0 \quad x = 7 \text{ of } x = 14 \text{ verwerft}$$

$$0,5x^2 + x + 4 = 22$$

$$\frac{2}{3}x^{\frac{3}{2}} + 3 = 5 \quad \sqrt{x+4} \quad \frac{2}{3}x^{\frac{3}{2}} = 2 \quad x^{\frac{3}{2}} = 3 \quad x = 3^{\frac{2}{3}}$$

$$3x^{-1,5} - 6 = x^{-1,5} \quad 2x^{-1,5} = 6 \quad x = 3^{-\frac{2}{3}}$$

$$x\sqrt{x} - \frac{2}{\sqrt{x}} = 0 \quad x^2 - 2 = 0 \quad x = \pm \sqrt{2}$$

$$0 = 60ax - \frac{10}{x^2} \quad 60ax^3 = 10 \quad x^3 = \frac{10}{60a} \quad x = \sqrt[3]{\frac{1}{6a}}$$

$$40) \frac{x^2 - 4x - 12}{x^2 - 4} = 0 \quad x = -2 \quad x = 6$$

$$41) \frac{x(x-a)^3(x+a)}{x^2 - a^2} = 0 \quad x = a \quad x = -a \text{ hnn.} \quad x = 0 \text{ wel.}$$

$$42) 2(4-2x^2) \cdot 3x - 3(2-x^2) \cdot 3x = 0 \quad 24x - 12x^3 - (18x - 9x^3) = 6x - 3x^3 = 0$$

$$43) (x-4)^2 \cdot (x+2) - (x+2)^2 \cdot (x-4) = 0 \quad x = 0 \quad x = \pm \sqrt{2}$$

$$44) x^2 \cdot e^x \cdot \left(1 + \frac{a}{x}\right) = 0 \quad (x+2)(x-4) \cdot (x-4 - (x+2)) = 0 \quad x = -2 \quad x = 4$$

$$45) ax - \frac{b}{x} = 0 \quad x = \sqrt{\frac{b}{a}}$$