

Lösungen quadratische Gleichungen I

Ergebnisse:

E1:	$4x^2 = 1 \Leftrightarrow x_1 = \frac{1}{2} \vee x_2 = -\frac{1}{2}$
E2:	$x^2 + 4x = 0 \Leftrightarrow x_1 = 0 \vee x_2 = -4$
E3:	$2x^2 - 16x + 14 = 0 \Leftrightarrow x_1 = 7 \vee x_2 = 1$
E4:	$(x+2)^2 = 16 \Leftrightarrow x_1 = 2 \vee x_2 = -6$
E5:	$4x^2 - 16 = 0 \Leftrightarrow x_1 = 2 \vee x_2 = -2$
E6:	$x^2 - 8x + 7 = 0 \Leftrightarrow x_1 = 7 \vee x_2 = 1$
E7:	$x^2 + \pi x = 0 \Leftrightarrow x_1 = 0 \vee x_2 = -\pi$
E8:	$2(x+3)^2 - 18 = 0 \Leftrightarrow x_1 = 0 \vee x_2 = -6$
E9:	$-x^2 + x = -\frac{1}{2} \Leftrightarrow x_1 = \frac{1}{2} + \sqrt{\frac{3}{4}} \vee x_2 = \frac{1}{2} - \sqrt{\frac{3}{4}}$
E10:	$3x^2 + 12x + 3 = 0 \Leftrightarrow x_1 = -2 + \sqrt{3} \vee x_2 = -2 - \sqrt{3}$
E11:	$-x^2 + 8x - 8 = 0 \Leftrightarrow x_1 = 4 + \sqrt{8} \vee x_2 = 4 - \sqrt{8}$
E12:	$4(x-4)^2 = 32 \Leftrightarrow x_1 = 4 + \sqrt{8} \vee x_2 = 4 - \sqrt{8}$
E13:	$\frac{1}{12}x^2 - x = 0 \Leftrightarrow x_1 = 0 \vee x_2 = 12$
E14:	$\frac{1}{4}x^2 + 2x - \frac{2}{5} = 0 \Leftrightarrow x_1 = -4 + \sqrt{\frac{88}{5}} \vee x_2 = -4 - \sqrt{\frac{88}{5}}$
E15:	$\frac{3}{16}x^2 - \frac{3}{4}x = 0 \Leftrightarrow x_1 = 0 \vee x_2 = 4$
E16:	$-\frac{3}{4}x^2 + 3x + 9 = 0 \Leftrightarrow x_1 = 6 \vee x_2 = -2$
E17:	$\frac{3}{2}x^2 - x - 4 = 0 \Leftrightarrow x_1 = 2 \vee x_2 = -\frac{4}{3}$
E18:	$\frac{3}{4}x^2 - \frac{1}{3}x = 0 \Leftrightarrow x_1 = 0 \vee x_2 = \frac{4}{9}$
E19:	$2x^2 - \frac{10}{3}x - \frac{4}{3} = 0 \Leftrightarrow x_1 = 2 \vee x_2 = -\frac{1}{3}$
E20:	$\frac{2}{3}x^2 + 4x = 0 \Leftrightarrow x_1 = 0 \vee x_2 = -6$

Ausführliche Lösungen:

A1	<p>Ausführliche Lösung</p> $4x^2 = 1 :4 \Leftrightarrow x^2 = \frac{1}{4} \sqrt{\quad} \Leftrightarrow x = \frac{1}{2} \Leftrightarrow x_1 = \frac{1}{2} \vee x_2 = -\frac{1}{2}$ <p>Probe:</p> $x_1 = \frac{1}{2} \Rightarrow 4 \cdot \left(\frac{1}{2}\right)^2 = 4 \cdot \frac{1}{4} = 1$ $x_2 = -\frac{1}{2} \Rightarrow 4 \cdot \left(-\frac{1}{2}\right)^2 = 4 \cdot \frac{1}{4} = 1$
A2	<p>Ausführliche Lösung</p> $x^2 + 4x = 0 \Leftrightarrow x(x+4) = 0 \Leftrightarrow x_1 = 0 \text{ (Satz vom Nullprodukt)}$ $x+4 = 0 -4 \Leftrightarrow x_2 = -4$ <p>Probe:</p> $x_1 = 0 \Rightarrow 0^2 + 4 \cdot 0 = 0 + 0 = 0$ $x_2 = -4 \Rightarrow (-4)^2 + 4 \cdot (-4) = 16 - 16 = 0$
A3	<p>Ausführliche Lösung</p> $2x^2 - 16x + 14 = 0 :2 \Leftrightarrow x^2 - 8x + 7 = 0$ $p = -8 \quad q = 7 \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = 16 - 7 = 9 \Rightarrow \sqrt{D} = \sqrt{9} = 3$ $x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = 4 + 3 = 7 \\ x_2 = 4 - 3 = 1 \end{array} \right. \Leftrightarrow x_1 = 7 \vee x_2 = 1$ <p>Probe:</p> $x_1 = 7 \Rightarrow 2 \cdot 49 - 16 \cdot 7 + 14 = 98 - 112 + 14 = 0$ $x_2 = 1 \Rightarrow 2 \cdot 1 - 16 \cdot 1 + 14 = 2 - 16 + 14 = 0$
A4	<p>Ausführliche Lösung</p> $(x+2)^2 = 16 \sqrt{\quad} \Leftrightarrow x+2 = 4$ $x+2 = 4 -2 \Leftrightarrow x_1 = 2$ $x+2 = -4 -2 \Leftrightarrow x_2 = -6 \Leftrightarrow x_1 = 2 \vee x_2 = -6$ <p>Probe:</p> $x_1 = 2 \Rightarrow (2+2)^2 = 4^2 = 16$ $x_2 = -6 \Rightarrow (-6+2)^2 = (-4)^2 = 16$

A5	<p>Ausführliche Lösung</p> $4x^2 - 16 = 0 :4 \Leftrightarrow x^2 - 4 = 0 +4 \Leftrightarrow x^2 = 4 \sqrt{} \Leftrightarrow x = 2 \Leftrightarrow x_1 = 2 \vee x_2 = -2$ <p>Probe:</p> $x_1 = 2 \Rightarrow 4 \cdot (2)^2 - 16 = 4 \cdot 4 - 16 = 16 - 16 = 0$ $x_2 = -2 \Rightarrow 4 \cdot (-2)^2 - 16 = 4 \cdot 4 - 16 = 16 - 16 = 0$
A6	<p>Ausführliche Lösung</p> $x^2 - 8x + 7 = 0$ $p = -8 \quad q = 7 \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = 16 - 7 = 9 \Rightarrow \sqrt{D} = \sqrt{9} = 3$ $x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = 4 + 3 = 7 \\ x_2 = 4 - 3 = 1 \end{array} \right. \Leftrightarrow x_1 = 7 \vee x_2 = 1$ <p>Probe:</p> $x_1 = 7 \Rightarrow 2 \cdot 49 - 16 \cdot 7 + 14 = 98 - 112 + 14 = 0$ $x_2 = 1 \Rightarrow 2 \cdot 1 - 16 \cdot 1 + 14 = 2 - 16 + 14 = 0$
A7	<p>Ausführliche Lösung</p> $x^2 + \pi x = 0 \Leftrightarrow x(x + \pi) = 0 \Leftrightarrow x_1 = 0 \text{ (Satz vom Nullprodukt)}$ $x + \pi = 0 -\pi \Leftrightarrow x_2 = -\pi$ <p>Probe:</p> $x_1 = 0 \Rightarrow 0^2 + \pi \cdot 0 = 0 + 0 = 0$ $x_2 = -\pi \Rightarrow (-\pi)^2 + \pi \cdot (-\pi) = \pi^2 - \pi^2 = 0$
A8	<p>Ausführliche Lösung</p> $2(x+3)^2 - 18 = 0 :2 \Leftrightarrow (x+3)^2 - 9 = 0 +9 \Leftrightarrow (x+3)^2 = 9 \sqrt{} \Leftrightarrow x+3 = 3$ $x+3 = 3 -3 \Leftrightarrow x_1 = 0$ $x+3 = -3 -3 \Leftrightarrow x_2 = -6 \Leftrightarrow x_1 = 0 \vee x_2 = -6$ <p>Probe:</p> $x_1 = 0 \Rightarrow 2(0+3)^2 - 18 = 2 \cdot 3^2 - 18 = 2 \cdot 9 - 18 = 18 - 18 = 0$ $x_2 = -6 \Rightarrow 2(-6+3)^2 - 18 = 2 \cdot (-3)^2 - 18 = 2 \cdot 9 - 18 = 18 - 18 = 0$

A9	<p>Ausführliche Lösung</p> $-x^2 + x = -\frac{1}{2} \mid +\frac{1}{2} \Leftrightarrow -x^2 + x + \frac{1}{2} \mid \cdot (-1) \Leftrightarrow x^2 - x - \frac{1}{2} = 0$ $p = -1 \quad q = -\frac{1}{2} \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = \frac{1}{4} + \frac{1}{2} = \frac{3}{4} \Rightarrow \sqrt{D} = \sqrt{\frac{3}{4}}$ $x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = \frac{1}{2} + \sqrt{\frac{3}{4}} \\ x_2 = \frac{1}{2} - \sqrt{\frac{3}{4}} \end{array} \right. \Leftrightarrow x_1 = \frac{1}{2} + \sqrt{\frac{3}{4}} \vee x_2 = \frac{1}{2} - \sqrt{\frac{3}{4}}$ <p>Probe:</p> $x_1 = \frac{1}{2} + \sqrt{\frac{3}{4}} \Rightarrow -\left(\frac{1}{2} + \sqrt{\frac{3}{4}}\right)^2 + \left(\frac{1}{2} + \sqrt{\frac{3}{4}}\right) = -\left(\frac{1}{4} + \frac{\sqrt{3}}{2} + \frac{3}{4}\right) + \left(\frac{1}{2} + \sqrt{\frac{3}{4}}\right)$ $= -\frac{1}{4} - \frac{\sqrt{3}}{2} - \frac{3}{4} + \frac{2}{4} + \frac{\sqrt{3}}{2} = -\frac{2}{4} = -\frac{1}{2}$ $x_2 = \frac{1}{2} - \sqrt{\frac{3}{4}} \Rightarrow -\left(\frac{1}{2} - \sqrt{\frac{3}{4}}\right)^2 + \left(\frac{1}{2} - \sqrt{\frac{3}{4}}\right) = -\left(\frac{1}{4} - \frac{\sqrt{3}}{2} + \frac{3}{4}\right) + \left(\frac{1}{2} - \sqrt{\frac{3}{4}}\right)$ $= -\frac{1}{4} + \frac{\sqrt{3}}{2} - \frac{3}{4} + \frac{2}{4} - \frac{\sqrt{3}}{2} = -\frac{2}{4} = -\frac{1}{2}$
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A10	<p>Ausführliche Lösung</p> $3x^2 + 12x + 3 = 0 \mid :3 \Leftrightarrow x^2 + 4x + 1 = 0$ $p = 4 \quad q = 1 \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = 4 - 1 = 3 \Rightarrow \sqrt{D} = \sqrt{3}$ $x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = -2 + \sqrt{3} \\ x_2 = -2 - \sqrt{3} \end{array} \right. \Leftrightarrow x_1 = -2 + \sqrt{3} \vee x_2 = -2 - \sqrt{3}$ <p>Probe:</p> $x_1 = -2 + \sqrt{3} \Rightarrow 3 \cdot (-2 + \sqrt{3})^2 + 12 \cdot (-2 + \sqrt{3}) + 3 = 3 \cdot (4 - 4 \cdot \sqrt{3} + 3) + 12 \cdot (-2 + \sqrt{3}) + 3$ $= 12 - 12 \cdot \sqrt{3} + 9 - 24 + 12 \cdot \sqrt{3} + 3 = 12 + 9 - 24 + 3 - 12 \cdot \sqrt{3} + 12 \cdot \sqrt{3} = 0$ $x_2 = -2 - \sqrt{3} \Rightarrow 3 \cdot (-2 - \sqrt{3})^2 + 12 \cdot (-2 - \sqrt{3}) + 3 = 3 \cdot (4 + 4 \cdot \sqrt{3} + 3) + 12 \cdot (-2 - \sqrt{3}) + 3$ $= 12 + 12 \cdot \sqrt{3} + 9 - 24 - 12 \cdot \sqrt{3} + 3 = 12 + 9 - 24 + 3 + 12 \cdot \sqrt{3} - 12 \cdot \sqrt{3} = 0$
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A11	<p>Ausführliche Lösung</p> $-x^2 + 8x - 8 = 0 \mid \cdot (-1) \Leftrightarrow x^2 - 8x + 8 = 0$ $p = -8 \quad q = 8 \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = 16 - 8 = 8 \Rightarrow \sqrt{D} = \sqrt{8}$ $x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = 4 + \sqrt{8} \\ x_2 = 4 - \sqrt{8} \end{array} \right. \Leftrightarrow x_1 = 4 + \sqrt{8} \vee x_2 = 4 - \sqrt{8}$ <p>Probe:</p> $x_1 = 4 + \sqrt{8} \Rightarrow -(4 + \sqrt{8})^2 + 8 \cdot (4 + \sqrt{8}) - 8 = -(16 + 8 \cdot \sqrt{8} + 8) + 8 \cdot (4 + \sqrt{8}) - 8$ $= -16 - 8 \cdot \sqrt{8} - 8 + 32 + 8 \cdot \sqrt{8} - 8 = -16 - 8 + 32 - 8 - 8 \cdot \sqrt{8} + 8 \cdot \sqrt{8} = 0$ $x_2 = 4 - \sqrt{8} \Rightarrow -(4 - \sqrt{8})^2 + 8 \cdot (4 - \sqrt{8}) - 8 = -(16 - 8 \cdot \sqrt{8} + 8) + 8 \cdot (4 - \sqrt{8}) - 8$ $= -16 + 8 \cdot \sqrt{8} - 8 + 32 - 8 \cdot \sqrt{8} - 8 = -16 - 8 + 32 - 8 + 8 \cdot \sqrt{8} - 8 \cdot \sqrt{8} = 0$
A12	<p>Ausführliche Lösung</p> $4(x-4)^2 = 32 \mid : 4 \Leftrightarrow (x-4)^2 = 8 \mid \sqrt{\quad} \Leftrightarrow x-4 = \sqrt{8}$ $x-4 = \sqrt{8} \mid + 4 \Leftrightarrow x_1 = 4 + \sqrt{8}$ $x-4 = -\sqrt{8} \mid + 4 \Leftrightarrow x_2 = 4 - \sqrt{8} \quad \Leftrightarrow x_1 = 4 + \sqrt{8} \vee x_2 = 4 - \sqrt{8}$ <p>Probe:</p> $x_1 = 4 + \sqrt{8} \Rightarrow 4(4 + \sqrt{8} - 4)^2 = 4(\sqrt{8})^2 = 4 \cdot 8 = 32$ $x_2 = 4 - \sqrt{8} \Rightarrow 4(4 - \sqrt{8} - 4)^2 = 4(-\sqrt{8})^2 = 4 \cdot 8 = 32$
A13	<p>Ausführliche Lösung</p> $\frac{1}{12}x^2 - x = 0 \Leftrightarrow x \left(\frac{1}{12}x - 1\right) = 0 \Leftrightarrow x_1 = 0 \text{ (Satz vom Nullprodukt)}$ $\frac{1}{12}x - 1 = 0 \mid + 1 \Leftrightarrow \frac{1}{12}x = 1 \mid \cdot 12 \Leftrightarrow x_2 = 12$ <p>Probe:</p> $x_1 = 0 \Rightarrow \frac{1}{12} \cdot 0^2 - 0 = 0 - 0 = 0$ $x_2 = 12 \Rightarrow \frac{1}{12} \cdot 12^2 - 12 = 12 - 12 = 0$

A14	<p>Ausführliche Lösung</p> $\frac{1}{4}x^2 + 2x - \frac{2}{5} = 0 \mid \cdot 4 \Leftrightarrow x^2 + 8x - \frac{8}{5} = 0$ $p = 8 \quad q = -\frac{8}{5} \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = 16 + \frac{8}{5} = \frac{88}{5} \Rightarrow \sqrt{D} = \sqrt{\frac{88}{5}}$ $x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = -4 + \sqrt{\frac{88}{5}} \\ x_2 = -4 - \sqrt{\frac{88}{5}} \end{array} \right. \Leftrightarrow x_1 = -4 + \sqrt{\frac{88}{5}} \vee x_2 = -4 - \sqrt{\frac{88}{5}}$ <p>Probe:</p> $x_1 = -4 + \sqrt{\frac{88}{5}} \Rightarrow \frac{1}{4} \left(-4 + \sqrt{\frac{88}{5}}\right)^2 + 2 \cdot \left(-4 + \sqrt{\frac{88}{5}}\right) - \frac{2}{5}$ $= \frac{1}{4} \left(16 - 8 \cdot \sqrt{\frac{88}{5}} + \frac{88}{5}\right) + 2 \cdot \left(-4 + \sqrt{\frac{88}{5}}\right) - \frac{2}{5}$ $= 4 - 2 \cdot \sqrt{\frac{88}{5}} + \frac{22}{5} - 8 + 2 \cdot \sqrt{\frac{88}{5}} - \frac{2}{5} = -4 + \frac{22}{5} - \frac{2}{5} = -\frac{20}{5} + \frac{22}{5} - \frac{2}{5} = 0$ $x_2 = -4 - \sqrt{\frac{88}{5}} \Rightarrow \frac{1}{4} \left(-4 - \sqrt{\frac{88}{5}}\right)^2 + 2 \cdot \left(-4 - \sqrt{\frac{88}{5}}\right) - \frac{2}{5}$ $= \frac{1}{4} \left(16 + 8 \cdot \sqrt{\frac{88}{5}} + \frac{88}{5}\right) + 2 \cdot \left(-4 - \sqrt{\frac{88}{5}}\right) - \frac{2}{5}$ $= 4 + 2 \cdot \sqrt{\frac{88}{5}} + \frac{22}{5} - 8 - 2 \cdot \sqrt{\frac{88}{5}} - \frac{2}{5} = -4 + \frac{22}{5} - \frac{2}{5} = -\frac{20}{5} + \frac{22}{5} - \frac{2}{5} = 0$
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A15	<p>Ausführliche Lösung</p> $\frac{3}{16}x^2 - \frac{3}{4}x = 0 \Leftrightarrow x \left(\frac{3}{16}x - \frac{3}{4}\right) = 0 \Leftrightarrow x_1 = 0 \text{ (Satz vom Nullprodukt)}$ $\frac{3}{16}x - \frac{3}{4} = 0 \mid + \frac{3}{4} \Leftrightarrow \frac{3}{16}x = \frac{3}{4} \mid \cdot \frac{16}{3} \Leftrightarrow x_2 = 4$ <p>Probe:</p> $x_1 = 0 \Rightarrow \frac{3}{16} \cdot 0^2 - \frac{3}{4} \cdot 0 = 0 - 0 = 0$ $x_2 = 4 \Rightarrow \frac{3}{16} \cdot 4^2 - \frac{3}{4} \cdot 4 = 3 - 3 = 0$
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A16	Ausführliche Lösung
$-\frac{3}{4}x^2 + 3x + 9 = 0 \mid \cdot \left(-\frac{4}{3}\right) \Leftrightarrow x^2 - 4x - 12 = 0$	
$p = -4 \quad q = -12 \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = 4 + 12 = 16 \Rightarrow \sqrt{D} = \sqrt{16} = 4$	
$x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = 2 + 4 = 6 \\ x_2 = 2 - 4 = -2 \end{array} \right. \Leftrightarrow x_1 = 6 \vee x_2 = -2$	
Probe:	
$x_1 = 6 \Rightarrow -\frac{3}{4} \cdot 36 + 3 \cdot 6 + 9 = -27 + 18 + 9 = 0$	
$x_2 = -2 \Rightarrow -\frac{3}{4} \cdot 4 + 3 \cdot (-2) + 9 = -3 - 6 + 9 = 0$	

A17	Ausführliche Lösung
$\frac{3}{2}x^2 - x - 4 = 0 \mid \cdot \frac{2}{3} \Leftrightarrow x^2 - \frac{2}{3}x - \frac{8}{3} = 0$	
$p = -\frac{2}{3} \quad q = -\frac{8}{3} \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = \frac{1}{9} + \frac{8}{3} = \frac{1}{9} + \frac{24}{9} = \frac{25}{9} \Rightarrow \sqrt{D} = \sqrt{\frac{25}{9}} = \frac{5}{3}$	
$x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = \frac{1}{3} + \frac{5}{3} = \frac{6}{3} = 2 \\ x_2 = \frac{1}{3} - \frac{5}{3} = -\frac{4}{3} \end{array} \right. \Leftrightarrow x_1 = 2 \vee x_2 = -\frac{4}{3}$	
Probe:	
$x_1 = 2 \Rightarrow \frac{3}{2} \cdot 4 - 2 - 4 = 6 - 2 - 4 = 0$	
$x_2 = -\frac{4}{3} \Rightarrow \frac{3}{2} \cdot \left(-\frac{4}{3}\right)^2 - \left(-\frac{4}{3}\right) - 4 = \frac{3}{2} \cdot \frac{16}{9} + \frac{4}{3} - 4 = \frac{8}{3} + \frac{4}{3} - \frac{12}{3} = 0$	

A18	Ausführliche Lösung
$\frac{3}{4}x^2 - \frac{1}{3}x = 0 \Leftrightarrow x \left(\frac{3}{4}x - \frac{1}{3}\right) = 0 \Leftrightarrow x_1 = 0 \text{ (Satz vom Nullprodukt)}$	
$\frac{3}{4}x - \frac{1}{3} = 0 \mid + \frac{1}{3} \Leftrightarrow \frac{3}{4}x = \frac{1}{3} \mid \cdot \frac{4}{3} \Leftrightarrow x_2 = \frac{4}{9}$	
Probe:	
$x_1 = 0 \Rightarrow \frac{3}{4} \cdot 0^2 - \frac{1}{3} \cdot 0 = 0 - 0 = 0$	
$x_2 = \frac{4}{9} \Rightarrow \frac{3}{4} \cdot \left(\frac{4}{9}\right)^2 - \frac{1}{3} \cdot \frac{4}{9} = \frac{3}{4} \cdot \frac{16}{81} - \frac{4}{27} = \frac{4}{27} - \frac{4}{27} = 0$	

A19	<p>Ausführliche Lösung</p> $2x^2 - \frac{10}{3}x - \frac{4}{3} = 0 \mid : 2 \Leftrightarrow x^2 - \frac{5}{3}x - \frac{2}{3} = 0$ $p = -\frac{5}{3} \quad q = -\frac{2}{3} \Rightarrow D = \left(\frac{p}{2}\right)^2 - q = \frac{25}{36} + \frac{2}{3} = \frac{25}{36} + \frac{24}{36} = \frac{49}{36} \Rightarrow \sqrt{D} = \sqrt{\frac{49}{36}} = \frac{7}{6}$ $x_{1/2} = -\frac{p}{2} \pm \sqrt{D} \quad \left \begin{array}{l} x_1 = \frac{5}{6} + \frac{7}{6} = 2 \\ x_2 = \frac{5}{6} - \frac{7}{6} = -\frac{1}{3} \end{array} \right. \Leftrightarrow x_1 = 2 \vee x_2 = -\frac{1}{3}$ <p>Probe:</p> $x_1 = 2 \Rightarrow 2 \cdot 4 - \frac{10}{3} \cdot 2 - \frac{4}{3} = \frac{24}{3} - \frac{20}{3} - \frac{4}{3} = 0$ $x_2 = -\frac{1}{3} \Rightarrow 2 \cdot \left(-\frac{1}{3}\right)^2 - \frac{10}{3} \cdot \left(-\frac{1}{3}\right) - \frac{4}{3} = \frac{2}{9} + \frac{10}{9} - \frac{12}{9} = 0$
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A20	<p>Ausführliche Lösung</p> $\frac{2}{3}x^2 + 4x = 0 \Leftrightarrow x \left(\frac{2}{3}x + 4\right) = 0 \Leftrightarrow x_1 = 0 \text{ (Satz vom Nullprodukt)}$ $\frac{2}{3}x + 4 = 0 \mid -4 \Leftrightarrow \frac{2}{3}x = -4 \mid \cdot \frac{3}{2} \Leftrightarrow x_2 = -6$ <p>Probe:</p> $x_1 = 0 \Rightarrow \frac{2}{3} \cdot 0^2 + 4 \cdot 0 = 0 + 0 = 0$ $x_2 = -6 \Rightarrow \frac{2}{3} \cdot (-6)^2 + 4 \cdot (-6) = 24 - 24 = 0$
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