

S 48 Nr. 3

$$d) 2x^5 - \frac{13}{3}x^3 + 2x = 0$$

$$x \cdot (2x^4 - \frac{13}{3}x^2 + 2) = 0 \Rightarrow \underline{x_1 = 0} \vee 2x^4 - \frac{13}{3}x^2 + 2 = 0 \mid \text{Sub: } x^2 = u$$

$$2u^2 - \frac{13}{3}u + 2 = 0 \Rightarrow u_{1,2} = \frac{\frac{13}{3} \pm \sqrt{(\frac{13}{3})^2 - 4 \cdot 2 \cdot 2}}{2 \cdot 2}$$

$$\Rightarrow u_{1,2} = \frac{\frac{13}{3} \pm \sqrt{\frac{25}{9}}}{4} \Rightarrow u_1 = \frac{6}{4} = \frac{3}{2} \vee u_2 = \frac{2}{3}$$

$$\text{Rück. Sub } x^2 = \frac{3}{2} \vee x^2 = \frac{2}{3}$$

$$x_{1,2} = \pm \sqrt{\frac{3}{2}} \vee x_{3,4} = \pm \sqrt{\frac{2}{3}} = \pm \frac{\sqrt{2} \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}}$$

$$x_{1,2} = \pm \frac{\sqrt{3} \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} \vee \underline{x_{3,4} = \pm \frac{1}{3} \cdot \sqrt{6}}$$

$$\underline{x_{1,2} = \pm \frac{1}{2} \cdot \sqrt{6}}$$

$$\underline{\underline{\text{Nullstellen} = \left\{ -\frac{1}{2}\sqrt{6}; -\frac{1}{3}\sqrt{6}; 0; +\frac{1}{3}\sqrt{6}; +\frac{1}{2}\sqrt{6} \right\}}}$$

$$e) (x - \frac{2}{3}) \cdot (x^4 - \frac{13}{6}x^2 + 1) = 0 \Rightarrow x - \frac{2}{3} = 0 \vee x^4 - \frac{13}{6}x^2 + 1 = 0$$

$$\underline{x_1 = +\frac{2}{3}}$$

$$x^4 - \frac{13}{6}x^2 + 1 = 0 \mid \text{Sub. } x^2 = u \Rightarrow u^2 - \frac{13}{6}u + 1 = 0 \Rightarrow$$

$$u_{1,2} = +\frac{13}{12} \pm \sqrt{(\frac{13}{12})^2 - 1} = \frac{13}{12} \pm \sqrt{\frac{25}{144}} = \frac{13}{12} \pm \frac{5}{12} \Rightarrow$$

$$u_1 = \frac{18}{12} = \frac{3}{2} \vee u_2 = \frac{8}{12} = \frac{2}{3}$$

$$\text{Rück. Sub } x^2 = \frac{3}{2}$$

$$x_{1,2} = \pm \sqrt{\frac{3}{2}} = \pm \frac{\sqrt{3} \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \pm \frac{1}{2} \cdot \sqrt{6} \vee \underline{x_{3,4} = \pm \sqrt{\frac{2}{3}} = \pm \frac{1}{3} \cdot \sqrt{6}}$$

$$\underline{\underline{\text{Nullstellen} = \left\{ -\frac{1}{2}\sqrt{6}; -\frac{1}{3}\sqrt{6}; \frac{2}{3}; +\frac{1}{3}\sqrt{6}; \frac{1}{2}\sqrt{6} \right\}}}$$