S 48 Nr. 2

e) $x^4 + 16 = 17x^2 \quad | -17x^2$

$x^4 - 17x^2 + 16 = 0 \quad |$ Sub: $x^2 = u$

$u^2 - 17u + 16 = 0 \Rightarrow u_{1,2} = \frac{17}{2} \pm \sqrt{\left(\frac{17}{2}\right)^2 - 16} = \frac{17}{2} \pm \sqrt{\frac{225}{4}}$

$u_1 = \frac{17}{2} + \frac{15}{2} = 16 \quad \vee \quad u_2 = \frac{17}{2} - \frac{15}{2} = \frac{2}{2} = 1$

Rück. Sub: $x^2 = 16 \quad \vee \quad x^2 = 1$

$\underline{\underline{x_{1,2} = \pm 4}} \quad \vee \quad \underline{\underline{x_{3,4} = \pm 1}}$

Nullstellen = $\underline{\{-4; -1; +1; 4\}}$

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f) $x^6 - 10x^3 + 9 = 0 \quad |$ Sub: $x^3 = u$

$u^2 - 10u + 9 = 0 \Rightarrow u_{1,2} = 5 \pm \sqrt{25 - 9} = 5 \pm 4$

$u_1 = 9 \quad \vee \quad u_2 = 1$

Rück. Sub $x^3 = 9 \quad \vee \quad x^3 = 1$

$\underline{\underline{x_1 = \sqrt[3]{9} = (3^2)^{\frac{1}{3}} = 3^{\frac{2}{3}}}} \quad \vee \quad \underline{\underline{x_2 = \sqrt[3]{1} = 1}}$