

Mathematik 3 für Wirtschaftsingenieure Lösungen der Probeklausur

1. a) divergent b) absolut konvergent c) divergent
d) divergent e) bedingt konvergent

2. b) z.B. $\mathbf{b} = \begin{pmatrix} 1 \\ 0 \\ 0 \\ 0 \end{pmatrix}$ c) $\langle \mathbf{a}_2, \mathbf{a}_3 \rangle = 2, \quad \langle \mathbf{a}_1 + \mathbf{a}_2, \mathbf{a}_3 \rangle = 3$ d) $\mathbf{p} = \begin{pmatrix} 0 \\ 0 \\ 0,5 \\ 0,5 \end{pmatrix}$

3. b) $A_0 = \frac{1}{2}, A_1 = \frac{1}{\pi}, A_2 = 0, A_3 = \frac{-1}{3\pi}, A_4 = 0, B_1 = \frac{1}{\pi}, B_2 = \frac{1}{\pi}, B_3 = \frac{1}{3\pi}, B_4 = 0$
c) $\frac{1}{2}$

4. $\frac{1}{12}$

5. $\frac{82\pi}{3}$

6. a) z.B. $\left\{ \begin{array}{l} -2 \leq x \leq 2 \\ -\sqrt{4-x^2} \leq y \leq \sqrt{4-x^2} \\ \sqrt{x^2+y^2} \leq z \leq 2 + \sqrt{4-x^2-y^2} \end{array} \right\}$ b) $\left\{ \begin{array}{l} 0 \leq r \leq 2 \\ 0 \leq \varphi \leq 2\pi \\ r \leq z \leq 2 + \sqrt{4-r^2} \end{array} \right\}$

7. b) $y = Ce^{-2\sqrt{x}} + \sqrt{x} - \frac{1}{2}$

9. $y = 3x^2 + 1$

10. a) $y_p = ax^3 + bx^4 + cx^5$ b) $y_p = (a + bx)e^{2x}$
c) $y_p = ax \sin(2x) + bx \cos(2x) + c \sin(3x) + d \cos(3x)$