

Analysis - 2 : Grenzwerte - CORRIGE

Man muss alles rechtfertigen !

1. Lösung :

$$\text{a. } \lim_{x \rightarrow 2} \frac{x^2 - 2x + 3}{x + 2} = \frac{3}{4}$$

$$\text{b. } \lim_{x \rightarrow 1} \frac{x^2 - 2x - 2}{x^2 - 1} = \infty$$

$$\text{c. } \lim_{x \rightarrow 4} \frac{x^2 - 7x + 12}{x^2 - 4} = \frac{0}{12} = 0$$

$$\text{d. } \lim_{x \rightarrow -2} \frac{x^2 + 5x + 6}{x^2 - 2x - 8} = \lim_{x \rightarrow -2} \frac{(x+2)(x+3)}{(x+2)(x-4)} = \lim_{x \rightarrow -2} \frac{x+3}{x-4} = -\frac{1}{6}$$

$$\text{e. } \lim_{x \rightarrow 1} \frac{x^3 - 2x^2 + 4x - 3}{x^2 - 3x + 2} = \lim_{x \rightarrow 1} \frac{(x-1)(x^2 - x + 3)}{(x-1)(x-2)} = \lim_{x \rightarrow 1} \frac{x^2 - x + 3}{x-2} = \frac{3}{-1} = -3$$

$$\text{f. } \lim_{x \rightarrow \infty} \frac{x+2}{x-1} = \lim_{x \rightarrow \infty} \frac{x}{x} = 1$$

$$\text{g. } \lim_{x \rightarrow \infty} \frac{3x^2 - 7x + 9}{2x - 3} = \lim_{x \rightarrow \infty} \frac{3x^2}{2x} = \lim_{x \rightarrow \infty} \frac{3x}{2} = \infty$$

$$\text{h. } \lim_{x \rightarrow \infty} \frac{4x^2 - 3x + 5}{7x^2 - 6} = \lim_{x \rightarrow \infty} \frac{4x^2}{7x^2} = \frac{4}{7}$$

$$\text{i. } \lim_{x \rightarrow \infty} \frac{x^2 - 3x - 5}{4x^3 - 2x^2 + x - 1} = \lim_{x \rightarrow \infty} \frac{x^2}{4x^3} = \lim_{x \rightarrow \infty} \frac{1}{4x} = 0$$

$$\text{j. } \lim_{x \rightarrow 3} \frac{\sqrt{x+6} - 3}{x^2 - 5x + 6} = \lim_{x \rightarrow 3} \left[\frac{\sqrt{x+6} - 3}{x^2 - 5x + 6} \cdot \frac{\sqrt{x+6} + 3}{\sqrt{x+6} + 3} \right] = \lim_{x \rightarrow 3} \frac{x-3}{(x-3)(x-2)(\sqrt{x+6} + 3)} =$$

$$\lim_{x \rightarrow 3} \frac{1}{(x-2)(\sqrt{x+6} + 3)} = \frac{1}{6}$$