

Exam 3(March 24, 2003)

MAC2312 Analytic Geometry and Calculus II (F. Lübeck)

(1) (5 points) Compute the integral

$$\int_1^2 \frac{4x^2 - 7x - 12}{x(x+2)(x-3)} dx.$$

(2) (5 points) Which of the indefinite integrals

$$\int_4^\infty 3e^{-4x} dx \quad \text{and} \quad \int_0^\infty \sin(2x) dx$$

converges? (Give a reason for your answer.) Find the value of the converging integral.

(3) (5 points) List the first five entries of the following sequences:

$$\{(-1)^n \sin(\pi n) \left(\frac{2}{7}\right)^{2n}\}, \quad \{(n-1)(n-2)(n-3)(n-4)\} \quad \text{and} \quad \left\{\frac{n!}{(n+1)!}\right\}$$

(4) (5 points) Which of the sequences

$$\left\{\frac{\sqrt{n+3}}{n+4}\right\} \quad \text{and} \quad \left\{\frac{5^{n+2}}{4^{n+10}}\right\}$$

converge? (Give a reason.) Find the limit of the converging sequences.