Final exam
28.01.10

Name:

Exercise 1. Compute the limit of the sequence:

$$a_n = \frac{\sin(\sqrt{n+2})}{n^2+1}.$$

Solution:

Exercise 2. Check whether the following series converges:

$$\sum_{n=1}^{\infty} \frac{2^n}{n\sqrt{2^n + 3^n}}.$$

Solution:

Exercise 3. For which values of parameters a, b the function f is continuous:

$$f(x) = \begin{cases} x & : \ x < 0 \\ x^2 + ax + b & : \ 0 \leq x < 1 \\ x + 3 & : \ 1 \leq x. \end{cases}$$

Solution:

Exercise 4. Compute the derivative of the function:

$$f(x) = e^{\sqrt{\log(x)}}.$$

Solution:

Exercise 5. Compute the limit:

$$\lim_{x \to 0} \frac{2\cos(x) - x^2 + 2}{x\sin(x) - x^2}.$$

Solution:

Exercise 6. Compute the indefinite integral:

$$\int \frac{dx}{1+\sqrt[3]{x+1}}.$$

Solution: