

Mathematics for Pharmacy Students

Sample Exam Sheets

1. Introduction

- ◆ **Maximum: 4 points** **Minimal level: 3 points**
- ◆ **Time: 20 minutes**

PROBLEM 1

How much of 15% and 60% concentrated solutions should be mixed to obtain 20 kg solution of 30% concentration?

PROBLEM 2

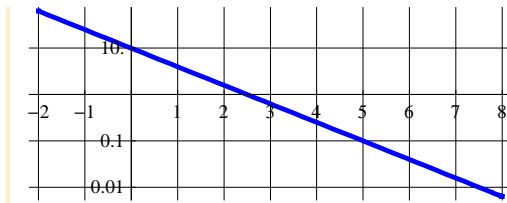
The domain and graph of the functions 2^x and $\log_2 x$.

PROBLEM 3

Write the equation of the straight line passing through the point $(1, -2)$ with the slope $a = 2$. Plot the graph, and calculate the zero point of it.

PROBLEM 4

Write the formula for the functions given in the following figures. Explain your solution.



2. Main Part

- ◆ **Maximum: 100 points** **Minimal level: 50 points**
- ◆ **Time: 90 minutes**

PROBLEM 1 (40 points)

Exponential and logarithmic functions: definition, properties, graphs. Rules for working with logarithms.

Logarithmic scales, logarithmic plots (log, loglin, loglog). Examples. Graphs from formulas, and formulas from graphs.

PROBLEM 2 (40 points)

Definite integral: definition and geometrical meaning. The fundamental theorem of integral calculus. Newton-Leibniz rule.

Examples. Application: find a function from the derivative.

PROBLEM 3 (10 points)

Integration by parts. Example: $\int x^2 e^x dx$.

PROBLEM 4 (10 points)

Definition and geometrical meaning of derivative. The tangent line of $f(x) = x^3 - 3x^2 + x$ at $x_0 = -1$.