12012, Sections 001 and 002, Calculus with Precalculus II.
HomeWork 8, due Wednesday April 11
Instructor: Prof. Artem Zvavitch
You must show all details of your calculations!

Problem 1. *Evaluate*

- $\log_5 0.04$
- $3^{\log_3 8}$.
- $9^{\log_3 8}$.
- $3^{\log_9 8}$.
- $\log_5 \sqrt{5}$.
- $\ln \frac{1}{e^2}$.
- $\log_2 112 - \log_2 7$.
- $\log_1 29 + \log_1 216$.
- $\log_2 8^{33}$.
- $\ln(\ln(\ln e^{e^{200}}))$.

Problem 2. *Simplify*

- $\log_5(x^2 - 1) - \log_5(x - 1)$

Problem 3. *Find x*

- $\log_x 25 = 2$.
- $\log_x 6 = \frac{1}{2}$.
- $10^{-2x} = 5$.
- $4(1 + 10^{5x}) = 9$.
- $7^{x/2} = 5^{1-x}$.
- $\frac{10}{1+e^{-x}} = 2$.
- $x^2 2^x - 2^x = 0$.
- $e^{-2x} - 2e^{-x} + 1 = 0$
- $\ln x = 10$.
- $\log_9(x - 5) + \log_9(x + 3) = 1$.
- $\log_5 x + \log_5(x + 1) = \log_5 20$.

Problem 4. *Find $f'(x)$*

- $f(x) = \ln(x^2 + 1)$.
- $f(x) = x \ln x$.
- $f(x) = \ln(\ln x)$.