

12012, Sections 001 and 002, Calculus with Precalculus II.

HomeWork 7, due Wednesday March 14

Instructor: Prof. Artem Zvavitch

You must show all details of your calculations!

Problem 1. Sketch the region enclosed by the given curves and find the area of this region:

- $y = x^3 - 2x^2 + 10$, $3x^2 + 4x - 10$.
- $y = x\sqrt{1-x^2}$, $y = \frac{1}{2}x$.
- $y = x^3 - 6x$, $y = 8 - 3x^2$.
- $y^2 = x + 5$, $y^2 = 3 - x$.
- $x = |y|$, $x = 1 - |y|$.

Problem 2. Find a formula for inverse function $f^{-1}(x)$ and find $(f^{-1})'(x)$.

- $f(x) = 3 + 4x$.
- $f(x) = \frac{2x-1}{x+2}$

Problem 3. Find $(f^{-1})'(1)$ if $f(x) = x^3 + x + 1$.

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

- $f(x) = e^{x^2}$.
- $f(x) = e^{-3x} \cos x$.
- $f(x) = e^{x \cos x}$.
- $f(x) = \frac{e^x}{1+x}$.