NOTE[1]

The due date is published on the course pages. Homework can be submitted only digitally. Instructions on labelling the "papers" can be found on the course pages.

1   Introductory Problems

INTRO 3   Use the definition of derivative to calculate

$$\frac{d}{dx}\left(\frac{x}{x^2+1}\right)\bigg|_{x=4}.$$

INTRO 4   Calculate the derivative of $f(x) = x^{1/3}$ using only the definition.
(Hint: Revise factoring of cubes $a^3 - b^3$.)

2   Homework Problems

EXERCISE 3   Let

$$f(x) = \frac{(a^2+x^2)^3}{(b-x^3)^2}.$$

Find all zeros of the derivative $f'(x)$.

EXERCISE 4   Find the angle between the tangents of the curves $y = \overline{\arcsin} x$ and $y = \overline{\arccos} x$ at the point of the intersection of the curves.
Answer: $\overline{\arctan}(2\sqrt{2}).$