

Homeworks for 6th week

- Find the intervals where the function is convex/concave. Determine the inflection points (if exist). (Don't forget the domains!)
 - $f(x) = \frac{x}{\ln x}$
 - $f(x) = x^2 \cdot e^{\frac{1}{x}}$
- Find the intervals where the function is convex/concave. Determine the inflection points (if exist). (Don't forget the domains!)
 - $f(x) = \frac{\ln x}{\sqrt{x}}$
 - $f(x) = \frac{x^2+1}{x^2-1}$
- Find the intervals where the function is convex/concave. Determine the inflection points (if exist). (Don't forget the domains!)
 - $f(x) = (1+x^2) \cdot e^{-x^2}$
 - $f(x) = x \ln^2 x$
- Find the intervals where the function is convex/concave. Determine the inflection points (if exist). (Don't forget the domains!)
 - $f(x) = \frac{1+\ln x}{x}$
 - $f(x) = \frac{x^3}{\sqrt{x^4+1}}$

Investigate the following functions

- $f(x) = \frac{x}{\sqrt[3]{x^2-1}}$
- $f(x) = \frac{x^4}{4} + x^3$
- $f(x) = x \cdot e^x$
- $f(x) = \frac{1}{x-1} \cdot e^{x-1}$

Recommended exercises

1. Determine the intervals where the function is convex/concave

(a) $f(x) = \operatorname{arctg} \frac{x}{2x-4}$

(b) $f(x) = \frac{3x^3}{2x^2+6}$

2. Investigate the following functions

(a) $f(x) = x + 2\operatorname{arccot} x$

(b) $f(x) = x + e^{-x}$

(c) $f(x) = \frac{\ln(x-1)}{x-1}$