

Problems and exercises
1st week

1. Sketch the graphs of following functions. Determine the domains and ranges.

(a) $f(x) = 2 \log_4(1 - x)$

(b) $f(x) = \frac{x+1}{2-x}$

(c) $f(x) = -\sqrt{3x+5} + 1$

2. Determine the domains of the definition.

(a) $f(x) = \frac{1}{\ln(5-x^2)}$

(b) $f(x) = \sqrt{\log_{\frac{1}{2}}(x-3)}$

(c) $f(x) = \frac{1}{\sqrt{\log_2(x+4)-3}}$

(d) $f(x) = \sqrt{\sin x - \frac{1}{2}}$

(e) $f(x) = \ln \log x^2$

3. Consider strictly decreasing function f on some set M . Prove that a function $-f$ is increasing on M . (Obviously, this proposition is reversible).