

# Exercises in Mathematics for Pharmacy Students

University of szeged - 2011

## 5. Domain & range, continuity, limits

### PROBLEM 1

Give the domain & range and the limits at the ends of the domain!

- |                       |                 |                  |                              |                               |
|-----------------------|-----------------|------------------|------------------------------|-------------------------------|
| a) $y = x^{-1}$       | b) $y = x^{-2}$ | c) $y = x^{2.5}$ | d) $y = 0,5^x$               | e) $y = \lg x$                |
| f) $y = \log_{0,5} x$ | g) $y = \sin x$ | h) $y = \cos x$  | i) $y = \operatorname{tg} x$ | j) $y = \operatorname{ctg} x$ |

### PROBLEM 2

Where is the function defined/continuous?

- |  |   |   |
|--|---|---|
| a) $y = \frac{\sqrt[3]{x}}{2x^2 + 3x - 2}$ | b) $y = \sqrt{2 - 3x + 2x^2}$           | c) $y = \lg\left(\frac{1-2x}{x+2}\right)$ |
| d) $y = \frac{1}{\sin x}$                  | e) $y = \sin \sqrt{x} + \cos \sqrt{-x}$ | f) $y = \sqrt[4]{\cos x - 1}$             |
| g) $y = \lg(\cos x - 1)$                   | h) $y = \lg(\cos x)$                    | i) $y = \log_4(\log_3(\log_2 x))$         |
| j) $y = \sin(x^{1/3})$                     | k) $y = \operatorname{tg}(x^{1/2})$     | l) $y = \operatorname{ctg}(x^3)$          |

### PROBLEM 3

Where are the following functions defined/continuous? Find the limits at the places of discontinuity and at +/- infinity.



