

## Quantitative methods - lecture 2

1) Domain of a function of the form: (function with linear expression)

a)  $f(x) = \frac{1}{2x-8}$

b)  $f(x) = \log(4x - 8)$

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

2) Domain of a function of the form: (function with quadratic expression)

Firstly, we must decompose this expression into a product.

We can use the formula  $a^2 - b^2 = (a - b)(a + b)$ .

$$9 - x^2 =$$

$$x^2 - 16 =$$

We can factor out:  $x^2 - 5x =$

$$4x - x^2 =$$

Solving the quadratic equation:  $x^2 - 7x + 10 =$

$$x^2 + 10x + 21 =$$

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Then we are going to solve quadratic inequation:

1) decomposition of expression into product

2) find zero points

3) find out what sign it takes in given interval (We choose number from interval and substitute it into the expression)

$$x^2 - 36 \geq 0$$

$$7x - x^2 < 0$$

$$x^2 + 8x + 15 \leq 0$$

Solve the domain of functions:

d)  $f(x) = \frac{1}{x^2-25}$

e)  $f(x) = \log(6x - x^2)$

f)  $f(x) = \sqrt{x^2 - 5x + 4}$