

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: $x^2 - 7x + 10 =$

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

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