

Student's name:

Information Technology: Final exam 21.01.2015

Question 1

Write a function to calculate surface area and volume of a cuboid (rectangular parallelepiped). Write a script to show usage of such function.

Question 2

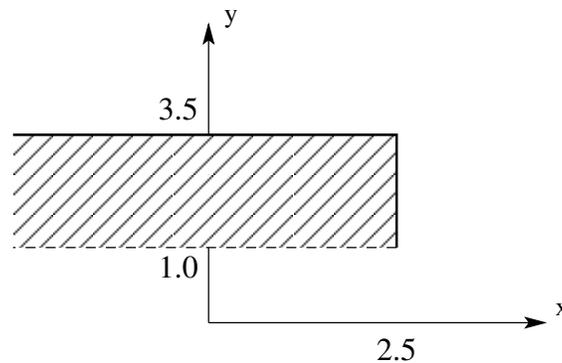
The sequence is given by the recursive formula:

$$\begin{aligned} a_1 &= 2 \\ a_{k+1} &= \sin(a_k + 1) \quad \text{for } k > 1 \end{aligned}$$

Write a program to show N initial elements of this sequence.

Question 3

Write a program to check if point $P(x, y)$ belongs to the hatched area in the figure below:



Pay attention to the marking of area borders.

Question 4

Write a function to calculate average segment length of a polyline. The function takes on input coordinates $x_i, y_i, i = 1, \dots, N$ of the polyline vertices.

Question 5

The sequence is given by the recursive formula:

$$\begin{aligned} a_1 &= \frac{1}{4} \\ a_k &= a_{k-1}^2 + 1 \quad \text{for } k \geq 2 \end{aligned}$$

Write a program to show N initial elements of this sequence.

Question 6

Write a function to calculate ratio between surface area and volume of a cuboid (rectangular parallelepiped). Write a script to show usage of such function.

Question 7

Write Octave function to calculate $f(x, a, b, N)$ where:

$$f(x, a, b, N) = a \sum_{i=1}^N (x/i + b)^i$$

Write a script to show usage of this function.