Preprocessing in Data Mining. The Rudimentary Operations in R. Laboratory 1

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0.1 (Manipulation on data represented by vectors).

Consider the sequence of (rational) numbers of the length = 10 from -1 to -2. Write the appropriate R-code that:

A generates this sequence,

B writes in the third element of the sequence,

C writes in all element without the first and the fifth one.

D writes in each value divided by the mean of all elements,

E ensures that the 8th element of the sequence from A is equal to 7th element of the sequence defined in point D.

F ensures that two first elements of a vector from A are equal to zero and values from the positions 4 and 5 are exchanged by values 7,8.

0.2 (Diagrams of functions).

Writhe the appropriate R-code to obtain the diagrams of the following functions:

A $f(x) = \frac{(\arctan(x)+\log_2(x))}{xe^x+5\cos(x)}$, for $x \in [-10, 0]$,

B $f(x) = \lim_{n\to\infty} \frac{1+\sin(x)+\sin^2(x)+\ldots+\sin^n(x)+\ldots}{1+\tan(x)+\tan^2(x)+\ldots+\tan^n(x)+\ldots}$, for $x \in [-\pi, \pi]$,

C $f(x) = \lim_{n\to\infty} \arcsin(\sqrt[n]{2^{nx}+3^{nx}+4^{nx}})$, for $x \in [1, 2]$,

D $f(x) = \arctan\left(\frac{x+2x+3x+\ldots+kx}{\sqrt[k]{1+x}+\sqrt[k]{2+k}+\ldots+\sqrt[k]{k+x}}\right)$, for $x \in [0, 1\rangle))$, $k \to \infty$.

E $f(x) = \frac{6}{\pi^2}\left(\sum_{k=1}^{\infty}\frac{1}{k^2}\right)x^2 - \left(\sqrt{2}^{\ln e^2}\right)x + 1$, for $x \in [-1, 1]$.