

Continuity of Functions

52. Determine the constant k so that the function

$$f(x) = \begin{cases} 5 & ; x \in (-\infty, 2), \\ x^2 - 10x + k & ; x \in [2, 6], \\ -3 & ; x \in (6, +\infty) \end{cases}$$

is continuous on \mathbb{R} , if possible.

53. Determine the constants α and β so that the functions

$$f(x) = \begin{cases} \operatorname{arctg}\left(\frac{1}{x}\right), & x \neq 0 \\ \alpha, & x = 0 \end{cases} \quad \text{and} \quad g(x) = \begin{cases} \operatorname{arctg}(x), & x \neq 0 \\ \beta, & x = 0 \end{cases}$$

are continuous on \mathbb{R} , if possible (if such constants exist).

All above math problems are taken from the following website:

<https://osebje.famnit.upr.si/~penjic/teaching.html>.

THE READER CAN FIND ALL SOLUTIONS TO THE GIVEN PROBLEMS ON THE SAME PAGE.