

## Mathematics in Economics - REPETITION

1) The domain of a function of the form  $f(x) = \ln(x - 1) + \sqrt{9 - x^2}$  is equal to the set:

2) For a cubic function defined as  $f: y = x^3 - 2x + 62$  specify the value of the first derivative at point  $x = 2$ .

3) The quadratic function of the form  $y = x^2 - 4x + 22$  has an extreme point:

4) Solve the system of two equations in  $R^2$ :

$$\begin{aligned}x - 2y &= 6 \\ -2x + 4y &= 1\end{aligned}$$

5) For a sequence determined by the  $n$ -th member

$$a_n = 3n^2 + 2n - 1, \text{ calculate the tenth member.}$$

6) Calculate the limit  $L = \lim_{x \rightarrow \infty} \frac{x^2 + 1}{2x^2 + 250}$ .

7) Calculate the multiplication of matrices  $S = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} \cdot \begin{pmatrix} 2 & 2 \\ 3 & 3 \end{pmatrix}$

8) Calculate:  $X = \begin{pmatrix} 2 & 3 \\ 3 & 1 \end{pmatrix} + \begin{pmatrix} 1 & 4 \\ 1 & -7 \end{pmatrix}^T$ .

9) Calculate:  $\begin{pmatrix} 8 \\ 8 \end{pmatrix} + \begin{pmatrix} 0 \\ 0 \end{pmatrix} + \begin{pmatrix} 7 \\ 1 \end{pmatrix}$ .

10) The set of all real solutions to inequality  $3x^2 + x + 9 > 0$  is:

11) Let  $A = (-\infty; 4)$ ;  $B = \langle 1; 8 \rangle$  be two intervals. Find an intersection of these two intervals:

12) Write down the elements of a set:  $C = \{x \in Z; -1 \leq x < 3\}$ .

13) Calculate  $s = 1 - \frac{1}{3} + \frac{1}{9} - \frac{1}{27} + \frac{1}{81} - \dots$