Course no. 66-110

Subject: Mathematics for economists

Duration of the exam: two and a half hours

1. Express your opinion and explain each of the following claims:

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| A.B.C. | 015.jpg |

1. The vertex of the parabola *f*(*x*) = *ax*2 + *bx* – 2 is located in the first quadrant (not on the axes). Then the following exists: *b*2 + 8*a* > 0, *a* < 0
2. *f*(*x*) = ln5 + 7, then *f*’(*x*) = 1/5
3. *f*(*x*) is differentiable for any *x* and it is given that *f*’(1) = 2 and *f*(1) = –1. We will define . Then *g*’(1) = 8
4. The function  is an injective (one-to-one) function.
5. for any *a*.
6. *f*(*x*) is defined for every *x*, *g*(*x*) = *f*(–*x*2), then *g*(*x*) is an odd function.
7. *f*(*x*) is defined for every *x*, *g*(*x*) = *f*(–*x*3), then *g*(*x*) is an even function.

2. Calculate the following limits:

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| A.B.C. | 019.jpg |

3. Given the function: 

1. Determine whether an inverse function exists for *f* and if so, find it.
2. Determine whether *f* is even, odd or neither odd nor even.
3. Calculate *f*(*f*(*x*))

4.

1. Calculate a and b such that the function will be continuous.

 

1. For a and b that you found in section A, find *f*’(*x*)

5. Differentiate the function 

 **GOOD LUCK!**