NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MAT 1022.E1 Midterm Exam SCORE \_\_\_\_\_\_\_\_

 Summer 2017

**INSTRUCTIONS: COMPLETE AND RETURN ONLY THE LAST PAGE ANSWER SHEET.**

I. Use **lim** 4x = 12 to identify:

 x→3

 1. f(x) \_\_\_\_\_\_\_\_\_\_\_\_ 2. a \_\_\_\_\_\_\_\_\_\_\_\_ 3. L \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 II. Use the graph of the function, f, to answer each question.



1.  \_\_\_\_\_\_\_\_\_\_

2.  \_\_\_\_\_\_\_\_\_\_

3.  \_\_\_\_\_\_\_\_\_\_

4.  \_\_\_\_\_\_\_\_\_\_\_\_\_

5. Is f continuous at

 x = -1? \_\_\_\_\_\_\_\_

6.  \_\_\_\_\_\_\_\_\_\_

7.  \_\_\_\_\_\_\_\_\_\_

8.  \_\_\_\_\_\_\_\_\_\_

9.  \_\_\_\_\_\_\_\_\_\_\_\_\_

10. Is f continuous at

 x = 2? \_\_\_\_\_\_\_\_\_\_\_\_

III.Find each limit, if it exists.

1.  \_\_\_\_\_\_\_\_\_\_\_\_\_

2.  \_\_\_\_\_\_\_\_\_\_

3.  \_\_\_\_\_\_\_\_\_\_\_

IV. Determine for  as given.

 1. 

2. 

3. 

 V. Is  continuous at x = 1? Why or Why not?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

VI. Write the equation of the tangent line to $y=x^{2}+3x-2$ at (1,2).

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 VII. At what value of x does the tangent line to $y=3x^{2}+18x-5$ have slope of zero?\_\_\_\_\_\_\_\_\_\_\_\_

 VIII. The consumer price index (CPI) of an economy is described by the function

  corresponds to the year 2007 and .

 1. What was the index value in 2008? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 2. What was the average rate of change from 2007 to 2009? \_\_\_\_\_\_\_\_\_\_\_\_\_

 3. How is the index changing in 2010? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

IX. The total cost function is $C\left(x\right)=0.1x^{2}+20x+3000$.

 1. What is the marginal cost function? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 2. What is marginal cost at output one hundred? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X. If P(x) =  gives daily profit in hundreds of dollars. 1. Find the instantaneous rate of change of profit function. 2. What is the marginal profit at output 213?

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# II. Matching

\_\_\_\_\_ 1.Left limit a. Slope of a secant line

\_\_\_\_\_ 2.Right limit b. If $y=e^{x}$ then $y^{'}=e^{x}$

\_\_\_\_\_ 3 Actual limit c. Symbolic representations

\_\_\_\_\_ 4. Functions value d. If $y=[g\left(x\right)]^{n}$ then $y^{'}=n[g\left(x\right)]^{n-1}g'(x)$

\_\_\_\_\_ 5. Continuous e. Slope of a tangent line

\_\_\_\_\_ 6. Removable discontinuity f. uv’ + vu’

\_\_\_\_\_ 7. Nonremovable discontinuity g. Approaching from the less than side

\_\_\_\_\_ 8. Average rate of change h. Function derived from another function

\_\_\_\_\_ 9. Derivative i. If y=ln x the y'=1/x

\_\_\_\_\_ 10. Derivative of a constant j. Hole in the graph

\_\_\_\_\_ 11. Power rule k. ($u'(x)v(x)-u(x)v'(x))/([v(x)])^{2}$

\_\_\_\_\_ 12. Product rule l. Zero

\_\_\_\_\_ 13. Quotient rule m. Approaching from the greater than side

\_\_\_\_\_ 14. Notations for derivatives n. The y-value

\_\_\_\_\_ 15. Notions about derivatives o. $nx^{(n-1)}$

\_\_\_\_\_ 16. Chain rule p. Marginal revenue

\_\_\_\_\_ 17. Derivative of revenue q. Break in the graph

\_\_\_\_\_ 18. Instantaneous rate of change r. Left and right are equal

\_\_\_\_\_ 19. “e” rule s. Limit equals function value

\_\_\_\_\_ 20. “ln” rule t. Ways of thinking about

**Mat1022.E1 Midterm Exam Answer Sheet Summer 2017 Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## I.Completion

I.1.\_\_\_\_\_\_\_\_ 2.\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_

II.1.\_\_\_\_\_2.\_\_\_\_\_3.\_\_\_\_\_4.\_\_\_\_\_5.\_\_\_\_\_

 6.\_\_\_\_\_7.\_\_\_\_\_8.\_\_\_\_\_9.\_\_\_\_\_10.\_\_\_\_

III.1.\_\_\_\_\_\_\_\_\_ 2.\_\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_\_

lV.1.\_\_\_\_\_\_\_\_\_\_\_2.\_\_\_\_\_\_\_\_\_\_\_\_\_3.\_\_\_\_\_\_\_\_\_\_\_\_\_

V.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vl.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vll.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Vlll. 1.\_\_\_\_\_\_\_\_\_\_ 2.\_\_\_\_\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_\_\_\_

lX.1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

X. 1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

I. Matching

1.\_\_\_\_

2.\_\_\_\_

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