This is a mock basic calculus exam, it is only meant as practice, it does not represent the actual test questions.

1) Given:

Find:

Is continuous at ? Explain.

2) Find the following limits:

3) Use the four step process (definition of the derivative) to find the derivative of:

The definition of the derivative is:

So:

4) Given , find the value(s) of x where the tangent line is horizontal.

5) Find the derivative of the given functions (no need to simplify your answer)

6) Use implicit differentiation to find and the equation of the tangent line to the curve at

Then the equation of the line with point is:

7) Determine the absolute maximum and minimum of the function on the interval

Find the critical values:

In the original function test the end points of the interval and any critical values between them:

8) Given the function

Find the interval(s) on which is increasing and decreasing.

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The function is increasing from:

The function is decreasing from:

Find the interval(s) on which is concave up and on which it is concave down.

The function is concave up from:

And concave down from:

10) Evaluate the following integrals

Let:

Then:

Let:

Then:

Let:

Then:

Let:

Then:

Let:

Then:

11) Suppose the marginal revenue equation is given as . If the revenue from selling 7 units is 1000 KD, find the total revenue function, .

Since:

12) Replica oil paintings sell for the price of KD when paintings are sold. If the cost of selling paintings is , write the functions for:

The revenue and profit equations:

Find the number of tickets to be sold to maximize revenue and then find the maximum revenue:

Since the revenue equation is a parabola opening downwards this is a maximum (make a line test for the first derivative to show that it is a maximum…)

Then: 3 paintings should be sold to maximize revenue

The maximum revenue is:

Interpret R’(10)

Which means the revenue is decreasing at a rate of 28 KD when 10 units are sold.