Weekly Assignment 10 – Review for Exam 3

1. Given a function *f*  represented by the graph below

Chart, line chart

Description automatically generated

Find the following

1. For each of the following, find the area under *f* over the indicated interval:
   1. on the interval [0, 1]
   2. on interval [1,3]
2. Given that , find a forula for *F*, which includes the value of the constant given that
3. Fill in the following table (slope on LHS is fine) given that *F’(x) = f(x)*:

|  |  |  |  |
| --- | --- | --- | --- |
| *x* | 1 | 4 | 7 |
| *f(x)* | 2 | -3 | Not needed |
| F(x) | 5 |  |  |

1. Given the following graph of *y = f(x),* let on the interval [0,2]. Complete the following:
2. Draw a numberline approximating where F is pos, neg or zero,
3. Draw a numberline labeling the signs (+,-,0) of F’ and F’’
4. Sketch a rough graph of *y = F(x)* on the given interval

Chart, line chart

Description automatically generatedI

1. Evaluate the following:
2. We wish to use Riemann sums to find the length of the curve from *x =1* to *x = 5* using the Left-Hand Side Rule (LHS) with 2 divisions.
   1. Sketch the graph *y = f(x)* and draw the tangent line segments you will use to approximate the length labeling the point used, the horizontal and the vertical distance for each division.
   2. Fill in the following table numerically

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Division | *x-*value used | Horizontal distance | Vertical Distance | Length of curve |
| 1 |  |  |  |  |
| 2 |  |  |  |  |

* 1. Fill in the same table using and

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Division | *x-*value used | Horizontal distance | Vertical Distance | Length of curve |
| 1 |  |  |  |  |
| 2 |  |  |  |  |

* 1. Express the approximation of the total length as a numeric sum.
  2. Express the approximation of the total length as a symbolic sum.
  3. Convert the symbolic sum in part e to a Riemann Sum in the form
  4. Take the appropriate limit to express the exact length of the curve as an integral. (No need to evaluate)

1. We wish to use Riemann sums with cylinders to approximate the mass of a concrete cone with base radius = 6 m and a height of 3 m. The concrete is denser at the base than at the top due to settling and is given by where *x* is the distance from the base of the cone. We are looking for the mass of the pyramid.
2. Sketch the cone and, divide it into *n* divisions so that the density is approximately constant for each division.
3. Draw a representative division: This is representative of the *ith* division, where *i* goes from 1 to n. Express the approximate mass for this division in terms of and
4. Express an approximation of the total mass of the cone in the form
5. Take the limit of part c to find an integral expression representing the precise mass. You do not need to solve this integral.