Name: Date:

Review 2 Riemann Sums and Area Under the Curve

For the homework, please do your work on graph paper. Use Cornell notes.

1. Examine the numerical table below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| y | 2 | 4 | 6 | 8 | 10 | 12 | 14 |

1. Using a left end point Riemann Sum:
   1. Make a graph of the table and draw 3 rectangles on the interval [0, 6].
   2. Find the approximated area under the curve.
2. Using a right end point Riemann Sum:
   1. Make a graph of the table and draw 3 rectangles on the interval [0, 6].
   2. Find the approximated area under the curve.
3. Using a Midpoint Riemann Sum:
   1. Make a graph of the table and draw 3 rectangles on the interval [0, 6].
   2. Find the approximated area under the curve.
4. Using a trapezoidal sum:
   1. Make a graph of the table and draw 3 trapezoids on the interval [0, 6].
   2. Find the approximated area under the curve.

2. Examine the numerical table below:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| y | 25 | 22 | 19 | 16 | 13 | 10 | 7 | 4 | 1 |

1. Using a left end point Riemann Sum:
   1. Make a graph of the table and draw 4 rectangles on the interval [0, 8].
   2. Find the approximated area under the curve.
2. Using a right end point Riemann Sum:
   1. Make a graph of the table and draw 4 rectangles on the interval [0, 8].
   2. Find the approximated area under the curve.
3. Using a Midpoint Riemann Sum:
   1. Make a graph of the table and draw 4 rectangles on the interval [0, 8].
   2. Find the approximated area under the curve.
4. Using a trapezoidal sum:
   1. Make a graph of the table and draw 4 trapezoids on the interval [0, 8].
   2. Find the approximated area under the curve.

What if the x values are not in equal increments (constant interval)? How does it change the process?

3. Examine the numerical table below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 0 | 2 | 5 | 9 | 10 |
| y | 66 | 60 | 52 | 44 | 43 |

1. Using a left Riemann Sum with 4 subintervals on [0, 10], find the approximated area under the curve.
2. Using a right Riemann Sum with 4 subintervals on [0, 10], find the approximated area under the curve.
3. Using a trapezoidal sum with 4 subintervals on [0, 10], find the approximated area under the curve.

4. Examine the numerical table below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 2 | 5 | 7 | 11 | 12 |
| y | 5.7 | 4.0 | 2.0 | 1.2 | 0.6 | 0.5 |

1. Using a left Riemann Sum with 5 subintervals on [0, 12], find the approximated area under the curve.
2. Using a right Riemann Sum with 5 subintervals on [0, 12], find the approximated area under the curve.
3. Using a trapezoidal sum with 5 subintervals on [0, 12], find the approximated area under the curve.

5. A test plan flies in a straight line with positive velocity v(t), in miles per minute at time *t* minutes, where *v* is a differentiable function of *t* and , shown below.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *t* (mins) | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| *v(t)* (miles per min) | 7.0 | 9.2 | 9.5 | 7.0 | 4.5 | 2.4 | 2.4 | 4.3 | 7.3 |

1. Using a midpoint Riemann Sum with 4 subintervals of equal length, to approximate .
2. Using the correct units, explain the meaning of  in terms of the plane’s flight.