Fundamental Theorem and Riemann Sums Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. We wish to use Riemann sums to find the area under the curve from *x = 0* to *x =*  using the Left-Hand Side Rule (LHS) with 3 divisions.
	1. Sketch the graph *y = f(x)* and draw the rectangles you will use to approximate the area labeling *(x,y)* at the LHS of each division as well as the values of and.
	2. Fill in the following table numerically

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Division | *x-*value used | Width | Height | Area |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |

* 1. Fill in the same table using and

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Division | *x-*value used | Width | Height | Area |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |

* 1. Express athe approximation of the total area as a numeric sum.
	2. Express athe approximation of the total area as a symbolic sum using and.
	3. Convert the symbolic sum in part e to a Riemann Sum in the form

 .

* 1. Take the appropriate limit of the Riemann sum that will convert to the precise area in the form and evaluate the integral to find the precise area.
1. We wish to use Riemann sums to find the area under the curve from *x = 0* to *x = 8* using the RHS Rule with 4 divisions.
	1. Sketch the graph *y = f(x)* and draw the rectangles you will use to approximate the area labeling *(x,y)* at the midpoint of each division as well as and.
	2. Fill in the following table numerically

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Division | *x-*value used | Width | Height | Area |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |

* 1. Fill in the same table using and

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Division | *x-*value used | Width | Height | Area |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |

* 1. Express athe approximation of the total area as a numeric sum.
	2. Express athe approximation of the total area as a symbolic sum using and.
	3. Convert the symbolic sum in part e to a Riemann Sum in the form

 .

* 1. Take the appropriate limit of the Riemann sum that will convert to the precise area in the form and evaluate the integral to find the precise area.