TABULAR RIEMANN SUMS

Sometimes the AP will ask you to find a Riemann sum, or to approximate an integral (same thing, right?), but won't give you a function to work with. Instead, they will give you a table of values for x and $f(x)$. These are quite simple to evaluate. All you do is use the right-hand or left-hand sum formula, plugging in the appropriate values for $f(x)$. One thing you should watch out for is that sometimes the x values are not evenly spaced, so make sure that you use the correct values for the width Let's do an example.

Example 4: Suppose we are given the following table of values for x and $f(x)$:

x	2	4	6	8	10	12
$f(x)$	10	13	15	14	9	3

Use a *right-hand* Riemann sum with 5 subintervals indicated by the data in the

$\int_2^{12} f(x)dx$.

Example 5: Given the following table of values for x and $f(x)$:

x	0	2	5	11	19	22	23
$f(x)$	4	6	16	18	22	29	50

Use a *left-hand* Riemann sum with 6 subintervals indicated by the data in the table to approximate $\int_0^{23} f(x)dx$.

Problem 6. Given the following table of values for t and $f(t)$:

t	0	2	4	7	11	13	14
$f(t)$	5	6	10	15	20	26	30

Use a *right-hand* Riemann sum with 6 subintervals indicated by the data in the table to approximate $\int_0^{14} f(t)dt$.

11. Suppose we are given the following table of values for x and $g(x)$:

x	0	1	3	5	9	14
$g(x)$	10	8	11	17	20	23

Use a left-hand Riemann sum with 5 subintervals indicated by the data in the table to approximate $\int_0^{14} g(x)dx$.

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KEY

Example 4: Suppose we are given the following table of values for x and $f(x)$:

x	2	4	6	8	10	12
$f(x)$	10	13	15	14	9	3

Use a *right-hand* Riemann sum with 5 subintervals indicated by the data in the table to approximate $\int_2^{12} f(x)dx$.

$\approx 2(13) + 2(15) + 2(14) + 2(9) + 2(3)$

$= 108$

Example 5: Given the following table of values for x and $f(x)$:

x	0	2	5	11	19	22	23
$f(x)$	4	6	16	18	22	29	50

Use a *left-hand* Riemann sum with 6 subintervals indicated by the data in the table to approximate $\int_0^{23} f(x)dx$.

$\approx 2(4) + (3)(6) + 6(16) + 8(18) + 3(22) + 1(29)$

$= 361$

Problem 6. Given the following table of values for t and $f(t)$:

t	0	2	4	7	11	13	14
$f(t)$	5	6	10	15	20	26	30

Use a *right-hand* Riemann sum with 6 subintervals indicated by the data in the table to approximate $\int_0^{14} f(t)dt$.

$\approx 2(6) + 2(10) + 3(15) + 4(20) + 2(26) + 1(30)$

$= 239$

11. Suppose we are given the following table of values for x and $g(x)$:

x	0	1	3	5	9	14
$g(x)$	10	8	11	17	20	23

Use a left-hand Riemann sum with 5 subintervals indicated by the data in the table to approximate $\int_0^{14} g(x)dx$.

$\approx 1(10) + 2(\cancel{18}\ 8) + 2(11) + 4(17) + 5(20)$

$= 216$