

AP Calculus
Day 83 Warm Up

Name _____

Date _____

1. Choose the correct statement given that $\int_0^7 f(x) dx = 8$ and $\int_1^7 f(x) dx = -3$.

a) $\int_7^1 f(x) dx = -3$

b) $\int_0^1 f(x) dx = 5$

c) $\int_1^0 f(x) dx = 11$

d) $\int_0^1 f(x) dx = 11$

e) $\int_0^1 f(x) dx = -11$

2. Use graphing techniques to help evaluate: $\int_1^3 |x^2 - 1| dx$

a) $\frac{8}{3}$

b) $\frac{14}{3}$

c) $\frac{20}{3}$

d) $\frac{15}{2}$

e) 16

3. $\int_0^a \sqrt{x} dx =$

a) $\frac{2a\sqrt{3}}{3}$

b) $\frac{a\sqrt{a}}{3}$

c) $\frac{2a\sqrt{a}}{3}$

d) $\frac{3a\sqrt{a}}{2}$

e) $\frac{5a\sqrt{a}}{3}$

4. Find $\frac{dy}{dx}$ given $y = \ln(5 - x)^6$.

a) $\frac{1}{(5-x)^6}$

b) $\frac{6}{x-5}$

c) $-6(5-x)^5$

d) $6(5-x)^5$

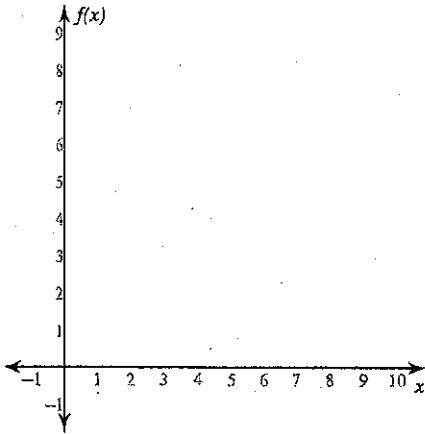
e) $-\frac{1}{5-x}$

Riemann Sum Tables

For each problem, use a left-hand Riemann sum to approximate the integral based off of the values in the table. You may use the provided graph to sketch the function data and Riemann sums.

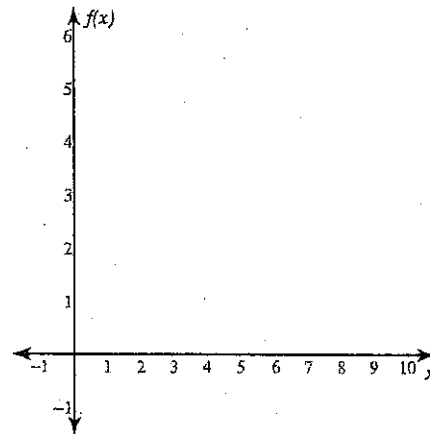
$$1) \int_0^{10} f(x) dx$$

x	0	2	5	7	10
$f(x)$	2	3	5	7	8



$$2) \int_0^{10} f(x) dx$$

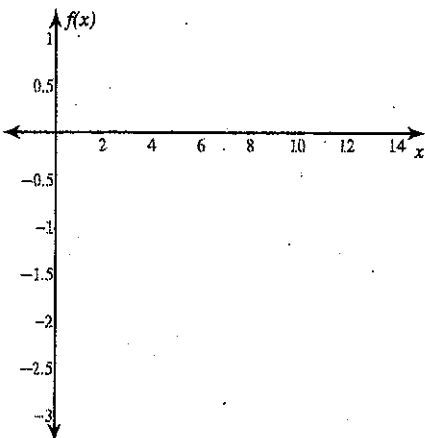
x	0	4	6	7	10
$f(x)$	5	3	2	3	5



For each problem, use a right-hand Riemann sum to approximate the integral based off of the values in the table. You may use the provided graph to sketch the function data and Riemann sums.

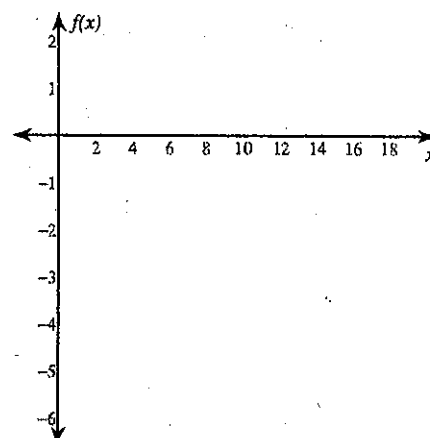
$$3) \int_0^{14} f(x) dx$$

x	0	3	5	9	13	14
$f(x)$	-1	-2	-1	0	-1	0



$$4) \int_0^{19} f(x) dx$$

x	0	4	9	10	12	19
$f(x)$	-3	-5	-4	-2	-1	1



AP Calculus

Day 83 Classwork Riemann Sums

Name _____

Date _____

1. Consider the integral $\int_1^4 \frac{1}{x} dx$ from $x = 1$ to $x = 4$. Using a Riemann sum with 6 sub-intervals calculate the area under the curve, and above the x -axis, using left endpoints. Answer to 3 decimal places.
- a) 1.218 b) 1.386 c) 1.593 d) 1.125 e) 2.073
2. Use a Riemann sum to approximate the area under the curve, and above the x -axis, for $y = x^3$ from $x = 2$ to $x = 5$ using 6 sub-intervals and *right* endpoints. Answer to 3 decimal places.
- a) 162.340 b) 152.250 c) 182.813 d) 183.452 e) 174.250
3. Use a Riemann sum to approximate the area under the curve, and above the x -axis, for $y = x^3$ from $x = 2$ to $x = 5$ using 6 sub-intervals and *left* endpoints. Answer to 3 decimal places.
- a) 162.340 b) 152.250 c) 186.340 d) 114.560 e) 124.313
4. Use a Riemann sum to approximate the area under the curve, and above the x -axis, for the curve $y = \ln x$ from $x = 2$ to $x = 4$ using 4 sub-intervals and *right* endpoints. Answer to 3 decimal places.
- a) 1.781 b) 2.185 c) 2.356 d) 1.980 e) 2.327

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5. Consider the integral $\int \sin x \, dx$ from $x = 0$ to $x = 2$. Using a Riemann sum with 4 sub-intervals calculate the area under the curve, and above the x -axis, using *left* endpoints. Answer to 3 decimal places.

a) 1.194 b) 2.357 c) 1.328 d) 1.135 e) 1.159

6. Use a Riemann sum to approximate the area under the curve, and above the x -axis, for the curve $y = \sqrt{x}$ from $x = 1$ to $x = 6$. Use 5 sub-intervals and *midpoints*.

a) 9.143 b) 11.207 c) 8.281 d) 10.525 e) 7.284

7. Use a Riemann sum to approximate the area under the curve, and above the x -axis, for the curve $y = e^x$ from $x = 0$ to $x = 4$. Use 4 sub-intervals and *midpoints*.

a) 51.428 b) 47.943 c) 53.201 d) 55.781 e) 49.381