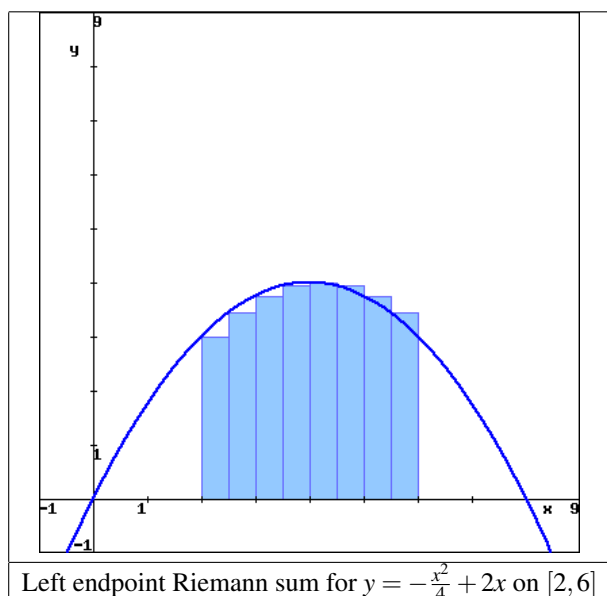


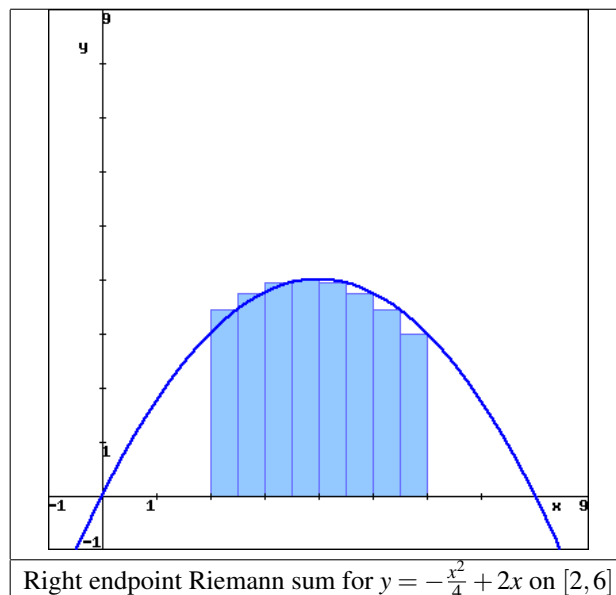
1. (2 pts) The rectangles in the graph below illustrate a left endpoint Riemann sum for $f(x) = -\frac{x^2}{4} + 2x$ on the interval $[2, 6]$.

The value of this left endpoint Riemann sum is _____, and this Riemann sum is an the area of the region enclosed by $y = f(x)$, the x-axis, and the vertical lines $x = 2$ and $x = 6$.



The rectangles in the graph below illustrate a right endpoint Riemann sum for $f(x) = -\frac{x^2}{4} + 2x$ on the interval $[2, 6]$.

The value of this right endpoint Riemann sum is _____, and this Riemann sum is an the area of the region enclosed by $y = f(x)$, the x-axis, and the vertical lines $x = 2$ and $x = 6$.



Answer(s) submitted:

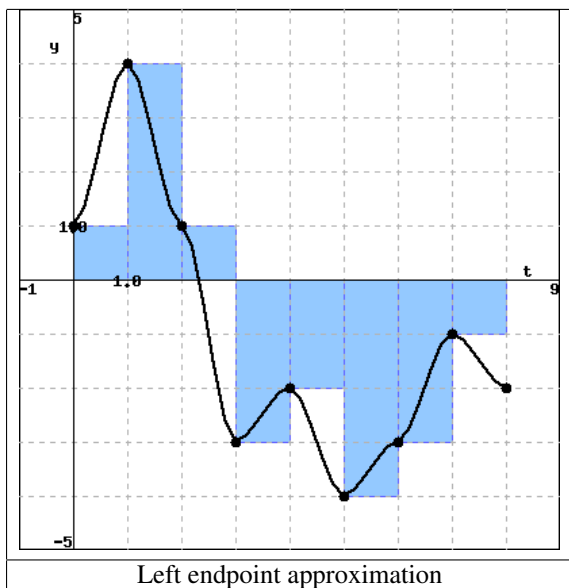
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(incorrect)

2. (2 pts) Your task is to estimate how far an object traveled during the time interval $0 \leq t \leq 8$, but you only have the following data about the velocity of the object.

time (sec)	0	1	2	3	4	5	6	7	8
velocity (feet/sec)	1	4	1	-3	-2	-4	-3	-1	-2

To get an idea of what the velocity function might look like, you pick up a black pen, plot the data points, and connect them by curves. Your sketch looks something like the black curve in the graph below.



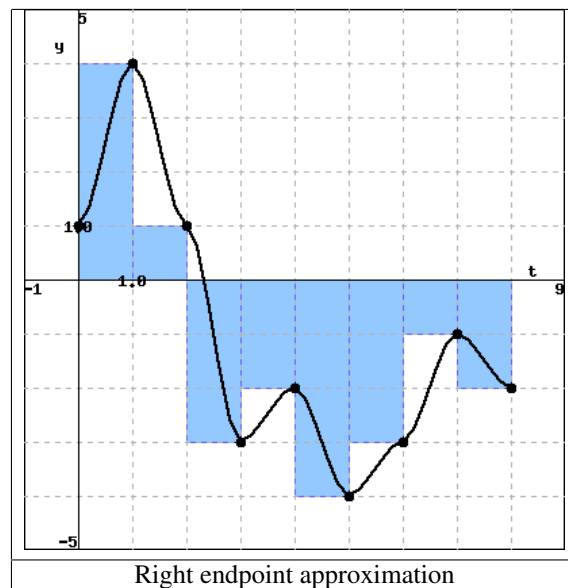
You decide to use a left endpoint Riemann sum to estimate the total displacement. So, you pick up a blue pen and draw rectangles whose height is determined by the velocity measurement at the left endpoint of each one-second interval. By using the left endpoint Riemann sum as an approximation, you are assuming that the actual velocity is approximately constant on each one-second interval (or, equivalently, that the actual acceleration is approximately zero on each one-second interval), and that the velocity and acceleration have discontinuous jumps every second. This assumption is probably incorrect because it is likely that the velocity and acceleration change continuously over time. However, you decide to use this approximation anyway since it seems like a reasonable approximation to the actual velocity given the limited amount of data.

(A) Using the left endpoint Riemann sum, find approximately how far the object traveled. Your answers must include the correct **units**.

Total displacement = _____

Total distance traveled = _____

Using the same data, you also decide to estimate how far the object traveled using a right endpoint Riemann sum. So, you sketch the curve again with a black pen, and draw rectangles whose height is determined by the velocity measurement at the right endpoint of each one-second interval.



(B) Using the right endpoint Riemann sum, find approximately how far the object traveled. Your answers must include the correct **units**.

Total displacement = _____

Total distance traveled = _____

Answer(s) submitted:

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(incorrect)

3. (2 pts) A stone is thrown straight up from the edge of a roof, 675 feet above the ground, at a speed of 10 feet per second.

A. Remembering that the acceleration due to gravity is -32 feet per second squared, how high is the stone 2 seconds later?

_____.

Don't forget to enter the correct **units**.

B. At what time does the stone hit the ground? _____.

C. What is the velocity of the stone when it hits the ground?

_____.

Answer(s) submitted:

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•

(incorrect)

4. (2 pts) A car traveling at 50 ft/sec decelerates at a constant 5 feet per second squared. How many feet does the car travel before coming to a complete stop?

_____.

Don't forget to enter the correct **units**.

Answer(s) submitted:

•

(incorrect)

5. (2 pts) On a sketch of $y = e^x$, represent the left Riemann sum with $n = 2$ approximating $\int_4^5 e^x dx$. Write out the terms of the sum, but do not evaluate it:

Sum = _____ + _____

On another sketch, represent the right Riemann sum with $n = 2$ approximating $\int_4^5 e^x dx$. Write out the terms of the sum, but do not evaluate it:

Sum = _____ + _____

Which sum is an overestimate?

- A. the right Riemann sum
- B. the left Riemann sum
- C. neither sum

Which sum is an underestimate?

- A. the right Riemann sum
- B. the left Riemann sum
- C. neither sum

Answer(s) submitted:

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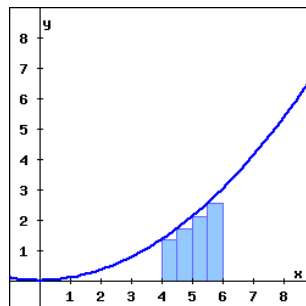
(incorrect)

6. (2 pts)

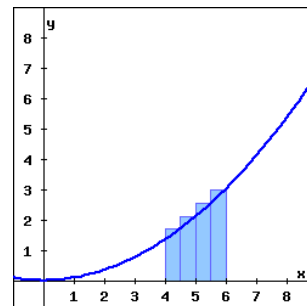
Suppose $f(x) = \frac{x^2}{12}$.

(a) The rectangles in the graph on the left illustrate a left endpoint Riemann sum for $f(x)$ on the interval $4 \leq x \leq 6$. The value of this left endpoint Riemann sum is _____, and it is an the area of the region enclosed by $y = f(x)$, the x-axis, and the vertical lines $x = 4$ and $x = 6$.

(b) The rectangles in the graph on the right illustrate a right endpoint Riemann sum for $f(x)$ on the interval $4 \leq x \leq 6$. The value of this right endpoint Riemann sum is _____, and it is an the area of the region enclosed by $y = f(x)$, the x-axis, and the vertical lines $x = 4$ and $x = 6$.



Left endpoint Riemann sum



Right endpoint Riemann sum

Answer(s) submitted:

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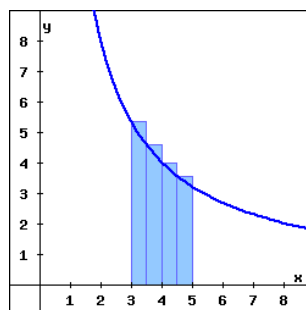
(incorrect)

7. (2 pts)

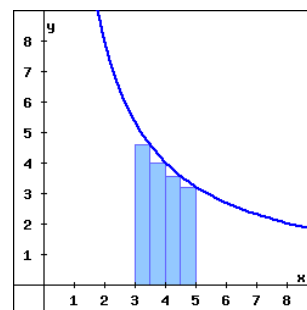
Suppose $f(x) = \frac{16}{x}$.

(a) The rectangles in the graph on the left illustrate a left endpoint Riemann sum for $f(x)$ on the interval $3 \leq x \leq 5$. The value of this left endpoint Riemann sum is _____, and it is an the area of the region enclosed by $y = f(x)$, the x-axis, and the vertical lines $x = 3$ and $x = 5$.

(b) The rectangles in the graph on the right illustrate a right endpoint Riemann sum for $f(x)$ on the interval $3 \leq x \leq 5$. The value of this right endpoint Riemann sum is _____, and it is an the area of the region enclosed by $y = f(x)$, the x-axis, and the vertical lines $x = 3$ and $x = 5$.



Left endpoint Riemann sum



Right endpoint Riemann sum

Answer(s) submitted:

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•
•

(incorrect)

