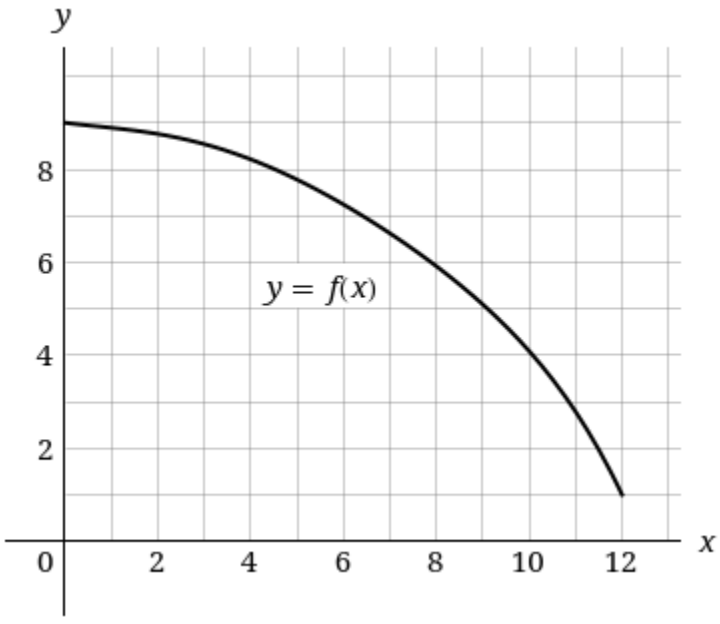
1. [–/1.5 Points] **DETAILS** SCALCET9 5.1.002.

The graph of the function f is given.



(a) Use six rectangles to find estimates of each type for the area under the given graph of f, the x-axis, and the lines $x = 0$ and $x = 12$.

(i) L_6 (sample points are left endpoints)

$L_6 =$ ☐

(ii) R_6 (sample points are right endpoints)

$R_6 =$ ☐

(iii) M_6 (sample points are midpoints)

$M_6 =$ ☐

(b) Is L_6 an underestimate or overestimate of the true area?

- ○ overestimate
- ○ underestimate

(c) Is R_6 an underestimate or overestimate of the true area?

- ○ overestimate
- ○ underestimate

(d) Which of the numbers L_6, R_6, or M_6 gives the best estimate of the true area?

- L_6
- R_6
- M_6

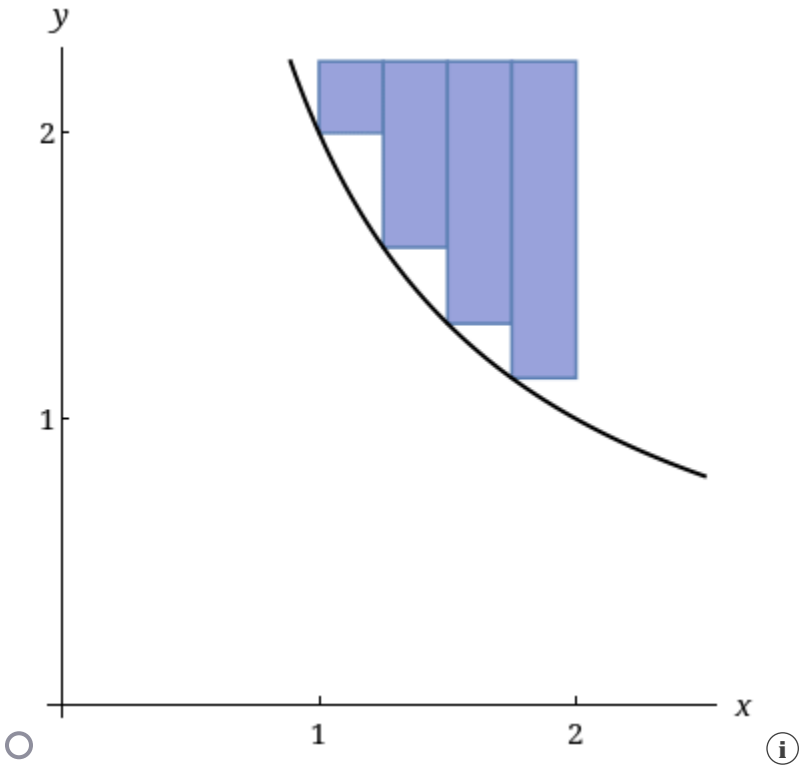
2. [–/1.5 Points] **DETAILS** SCALCET9 5.1.003.

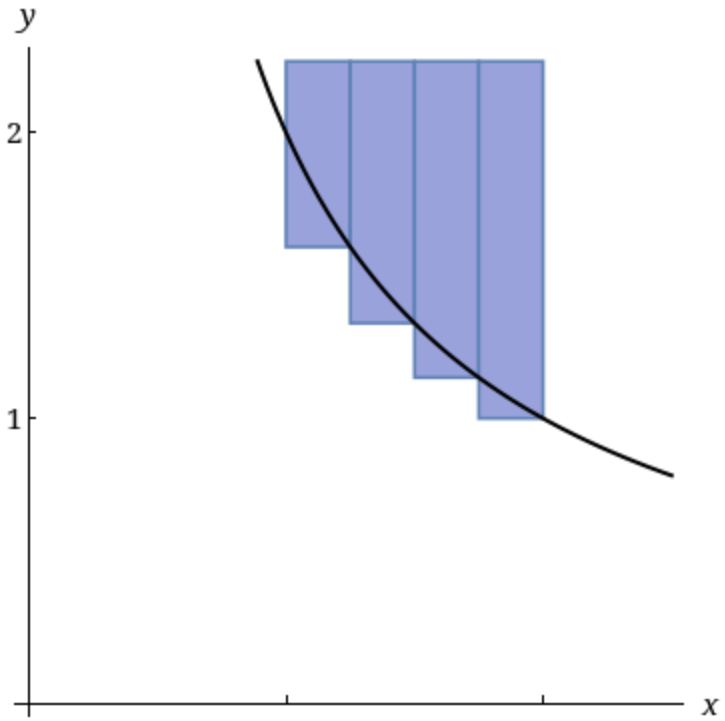
Unless specified, all approximating rectangles are assumed to have the same width.

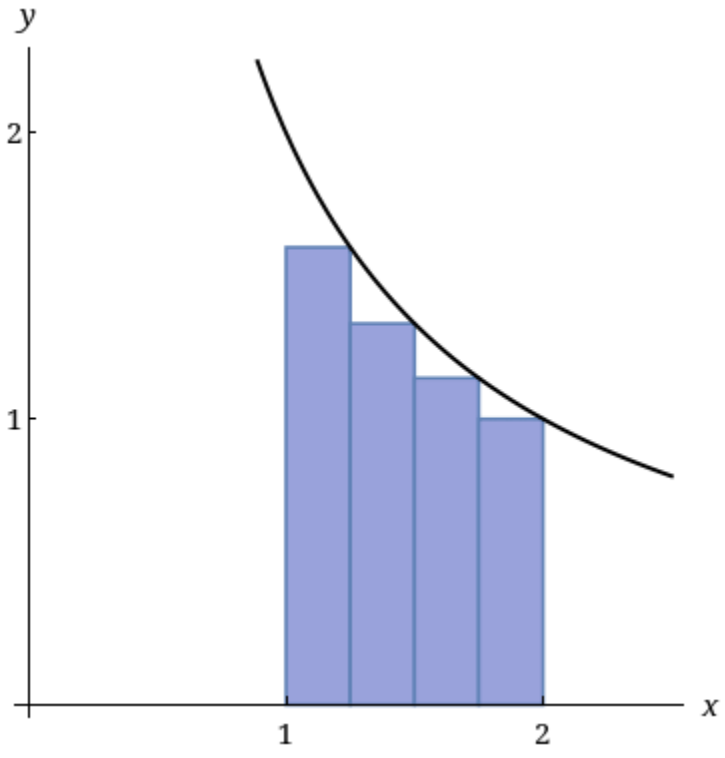
Let $f(x) = \frac{2}{x}$.

(a) Estimate the area under the graph of f, the x-axis, and the lines $x = 1$ and $x = 2$ using four approximating rectangles and right endpoints. (Round your answer to four decimal places.)

Sketch the graph and the rectangles.




y
2
1
x
1
2


y
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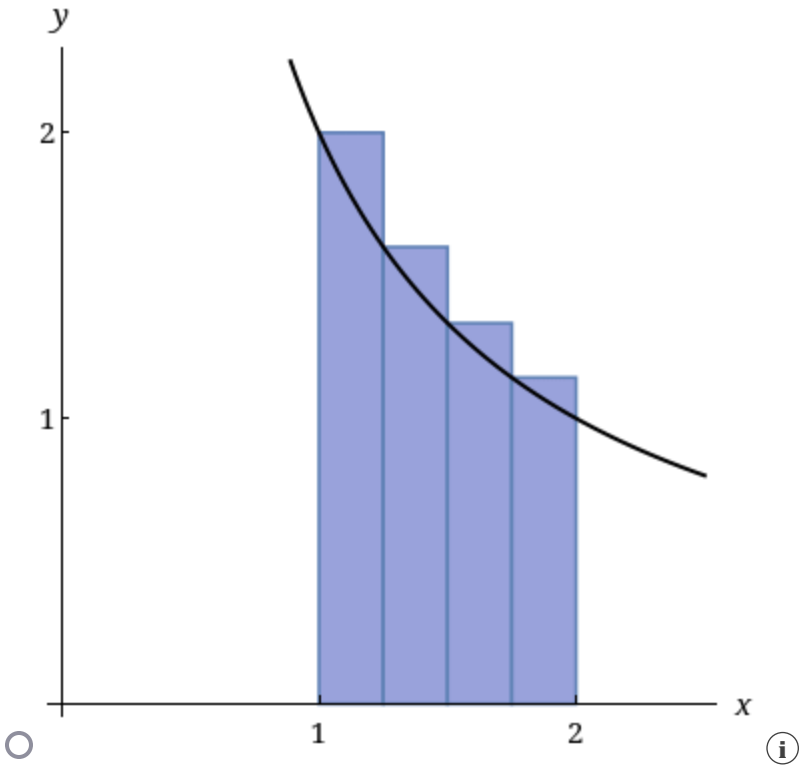
1
x
1
2

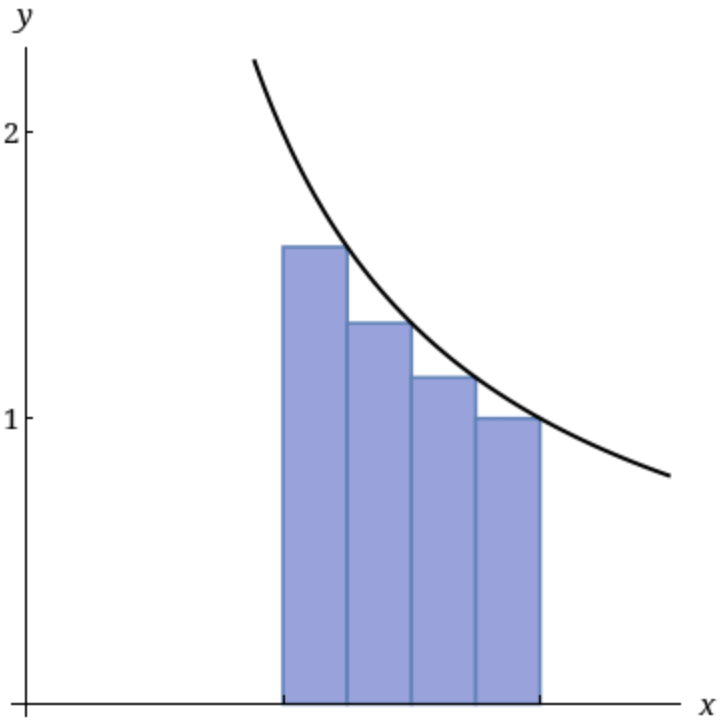


Is your estimate an underestimate or an overestimate of the true area?

- underestimate
- overestimate

(b) Repeat part (a) using a left endpoints. (Round your answer to four decimal places.)

Sketch the graph and the rectangles.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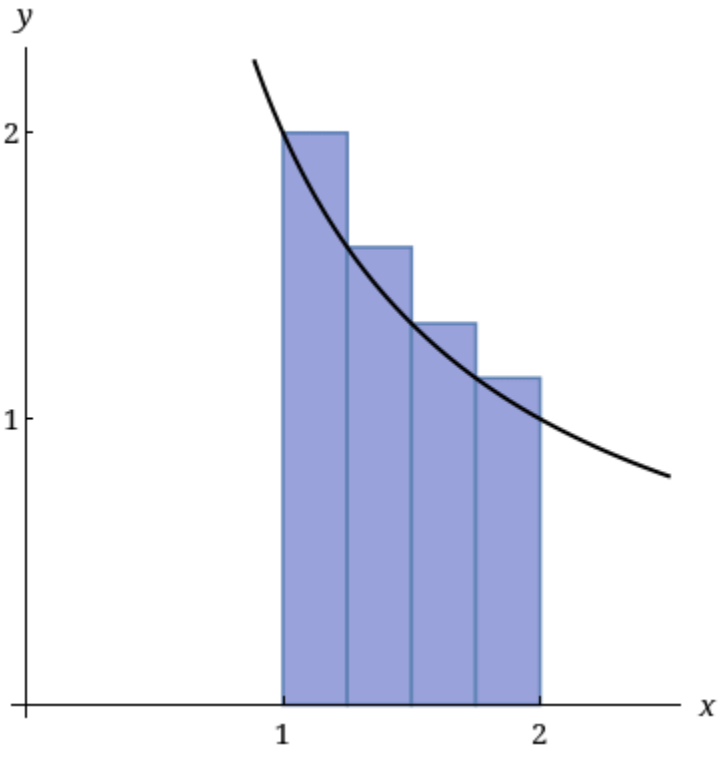
1
x
1
2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1
x
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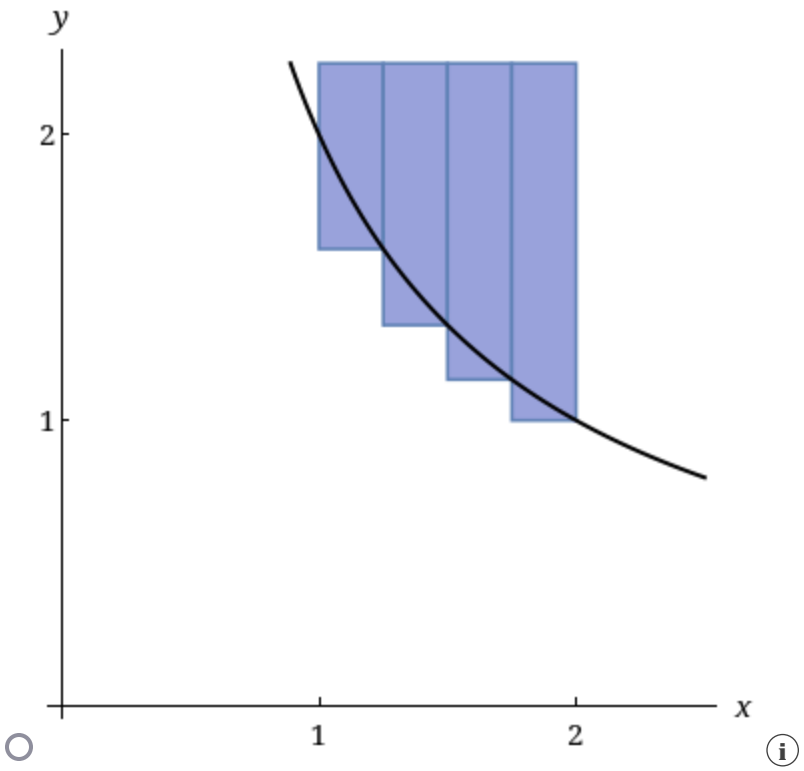
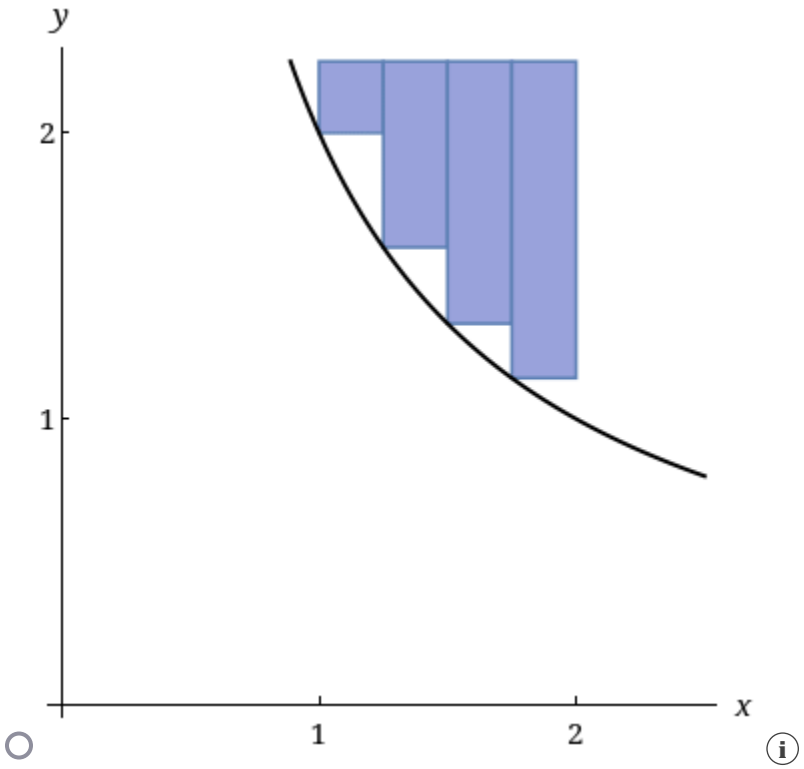
2





Is your estimate an underestimate or an overestimate of the true area?

- underestimate
- overestimate

3. [–/1.5 Points] DETAILS SCALCET9 5.1.011.MI.

Oil leaked from a tank at a rate of $r(t)$ liters per hour. The rate decreased as time passed, and values of the rate at two-hour time intervals are shown in the table.

t (h)	0	2	4	6	8	10
$r(t)$ (L/h)	8.6	7.5	6.7	6.2	5.6	5.1

Find lower and upper estimates for the total amount of oil (in liters) that leaked from the tank over the interval [0, 10]. (Use five equal subintervals.)

lower estimate [ ] L

upper estimate [ ] L

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4. [–/1.5 Points] DETAILS SCALCET9 5.XP.1.007.

The table shows the number of people per day who died from SARS in Singapore at two-week intervals beginning on March 1, 2003.

Date	Deaths per day
March 1	0.0079
March 15	0.0638
March 29	0.1944
April 12	0.4435
April 26	0.5620
May 10	0.4630
May 24	0.2897

†

(a) By using an argument similar to that in this example, estimate the number of people who died of SARS in Singapore between March 1 and May 24, 2003, using both left endpoints and right endpoints. (Round your answers to the nearest whole number.)

left endpoint [ ] people

right endpoint [ ] people

(b) How would you interpret the number of SARS deaths as an area under a curve?

This answer has not been graded yet.

5. [–/1 Points] DETAILS SCALCET9 5.JIT.1.002.

Write the sum using sigma notation.

$$1^2 + 2^2 + 3^2 + \cdots + 9^2$$

$$\left(\square \sum_{k=1} \right)$$

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6. [–/1.5 Points] DETAILS SCALCET9 5.JIT.1.003.

Find the sum.

$$\sum_{k=1}^{8} 2^{k-1}$$

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7. [–/1.5 Points] **DETAILS** SCALCET9 5.JIT.1.007.MI.

Find the sum.

$$\sum_{k=3}^{7} 7(k+2)^2(k-5)$$

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