

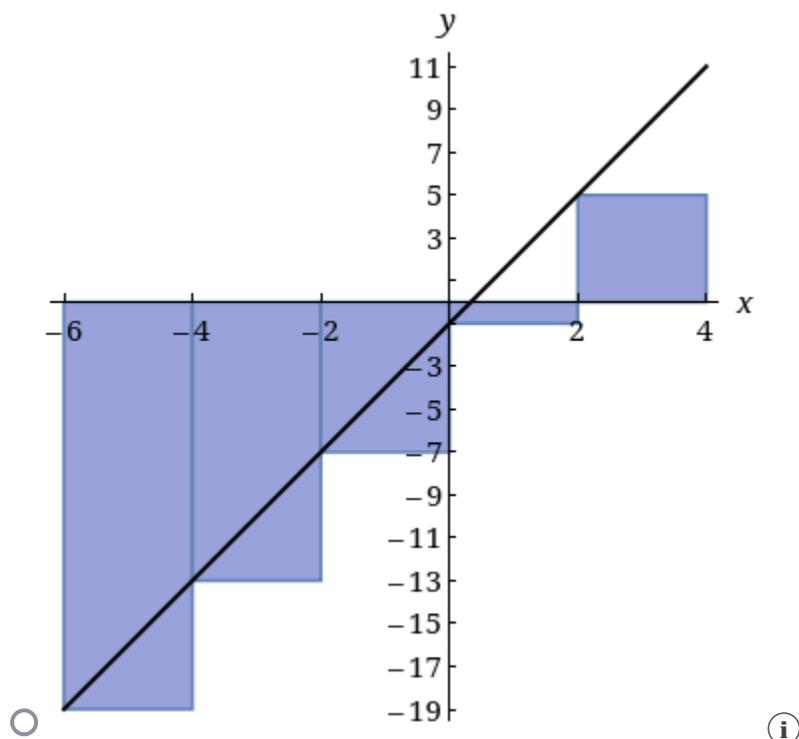
1. [-/2 Points]

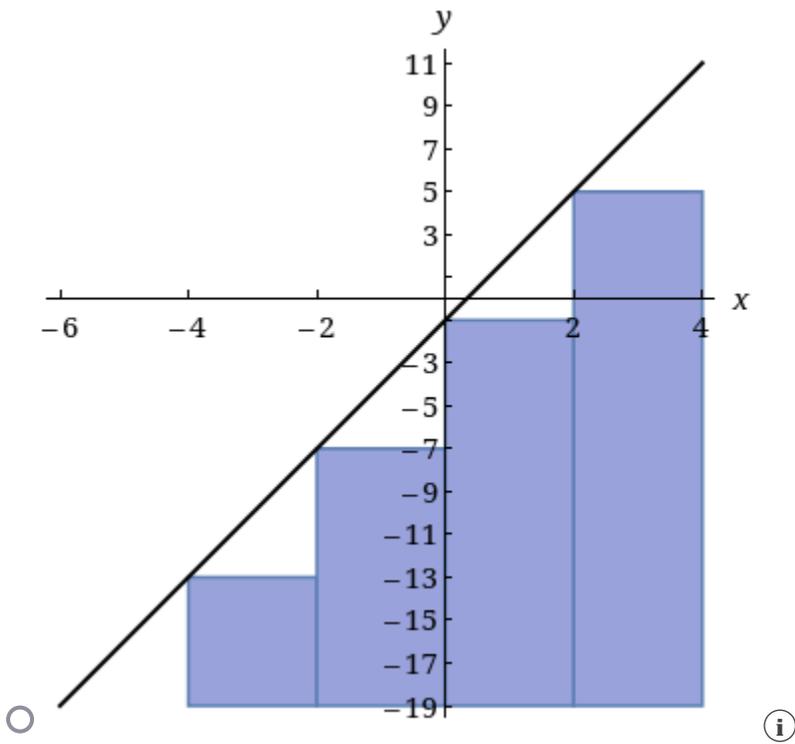
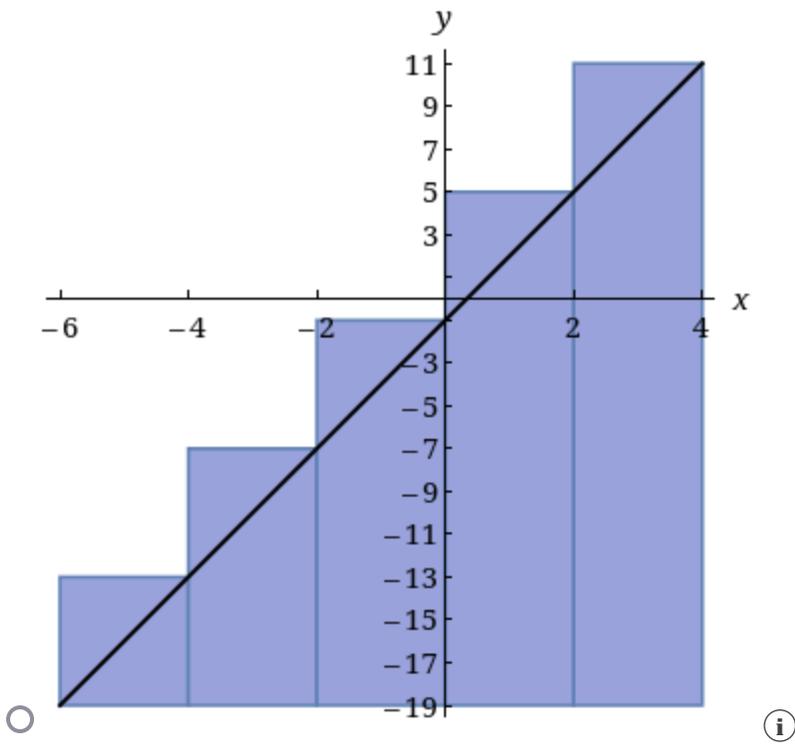
DETAILS

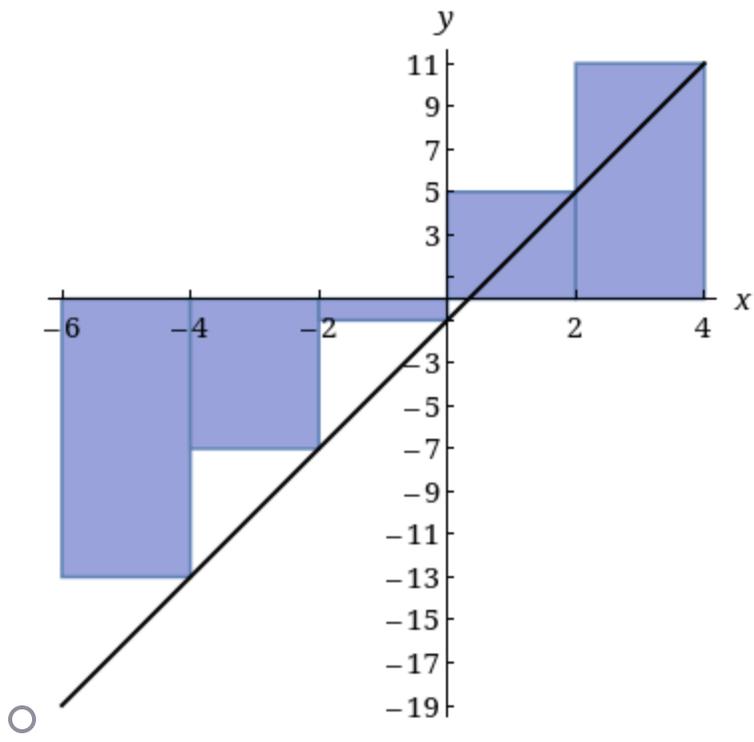
SCALCET9 5.2.001.

Find the Riemann sum for $f(x) = 3x - 1$, $-6 \leq x \leq 4$, with five equal subintervals, taking the sample points to be right endpoints.

Explain, with the aid of a diagram, what the Riemann sum represents.







The Riemann sum represents the net area of the rectangles with respect to the .

2. [-/2 Points]

DETAILS

SCALCET9 5.2.002.

If

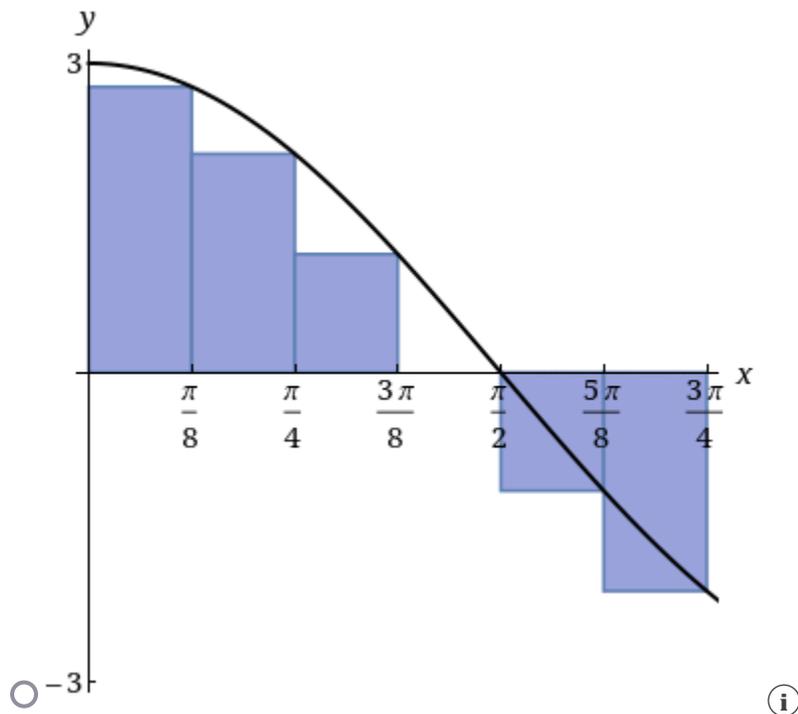
$$f(x) = 3 \cos(x), \quad 0 \leq x \leq \frac{3\pi}{4},$$

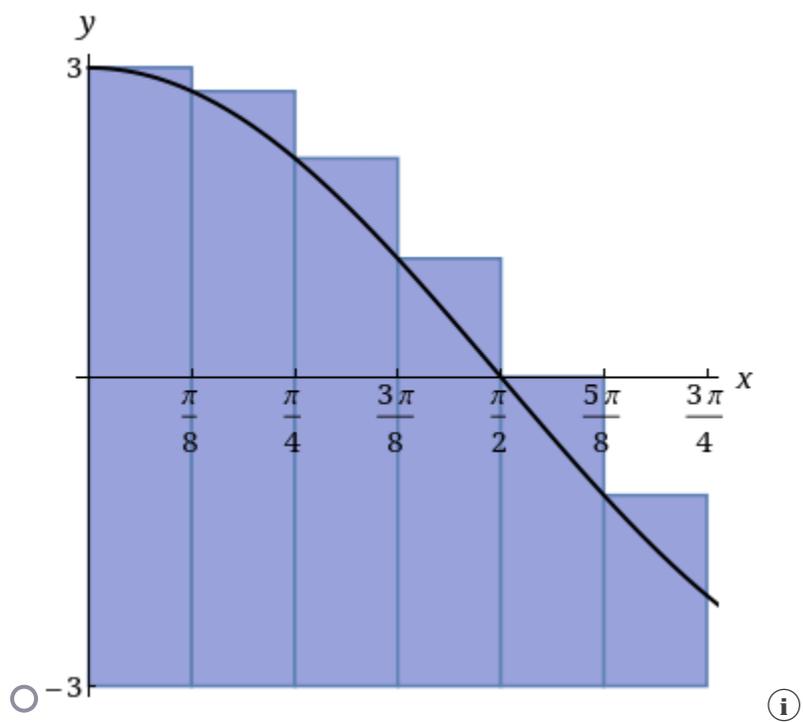
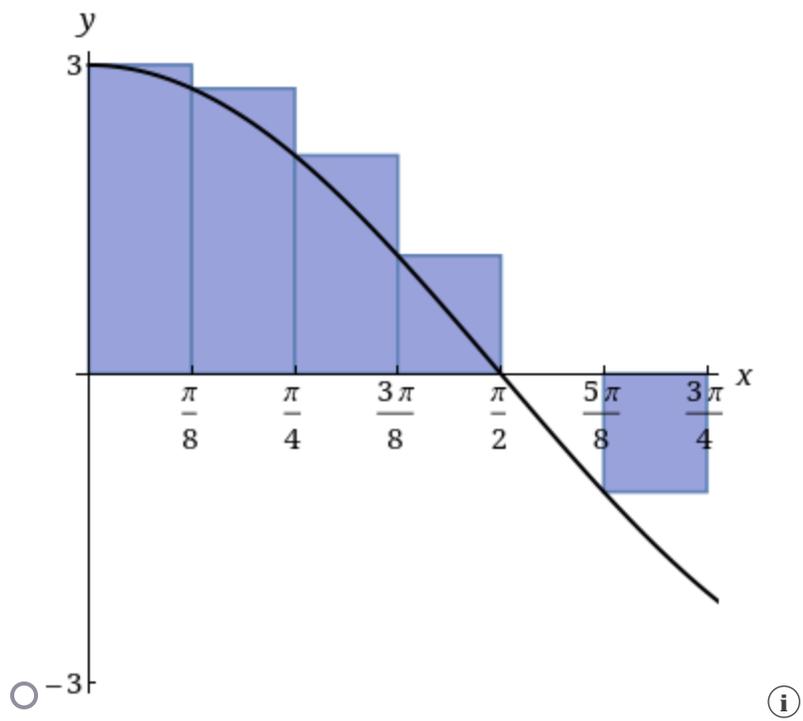
evaluate the left Riemann sum with $n = 6$, taking the sample points to be left endpoints. (Round your answer to six decimal places.)

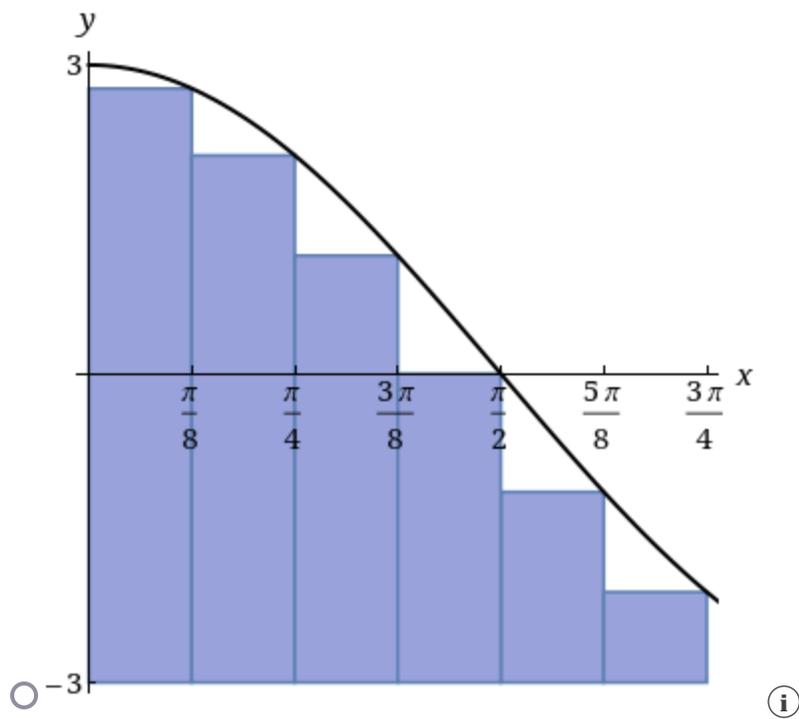
What does the Riemann sum represent?

The Riemann sum represents the net area of the rectangles with respect to the .

Illustrate with a diagram.







3. [-/2 Points]

DETAILS

SCALCET9 5.XP.2.009.

Use the [midpoint rule](#) with the given value of n to approximate the integral. (Round your answer to four decimal places.)

$$\int_0^{32} \sin(\sqrt{x}) \, dx, \quad n = 4$$

Need Help?

4. [-/2 Points]

DETAILS

SCALCET9 5.XP.2.027.

Evaluate the integral by interpreting it in terms of areas.

$$\int_0^9 \left(\frac{1}{3}x - 2 \right) dx$$

5. [-/2 Points]

DETAILS

SCALCET9 5.2.056.

Given that $\int_a^b x \, dx = \frac{b^2 - a^2}{2}$, use this result and the fact that $\int_0^{\pi/2} \cos(x) \, dx = 1$, together with the

properties of definite integrals, to evaluate $\int_0^{\pi/2} (3 \cos(x) - 2x) \, dx$.

6. [-/2 Points]

DETAILS

SCALCET9 5.2.059.

If $\int_0^8 f(x) \, dx = 37$ and $\int_0^8 g(x) \, dx = 18$, find $\int_0^8 [3f(x) + 5g(x)] \, dx$.

Need Help?

7. [-/2 Points]

DETAILS

SCALCET9 5.2.043.

Evaluate the integral by interpreting it in terms of areas.

$$\int_{-7}^4 \left| \frac{1}{2}x \right| dx$$

Need Help?

Watch It

8. [-/2 Points]

DETAILS

SCALCET9 5.2.058.MI.

If $\int_1^5 f(x) dx = 9.4$ and $\int_3^5 f(x) dx = 5.6$, find $\int_1^3 f(x) dx$.

Need Help?

Master It

9. [-/2 Points]

DETAILS

SCALCET9 5.XP.2.022.MI.

Evaluate the integral by interpreting it in terms of areas.

$$\int_{-5}^5 (4 - 2x) dx$$

Need Help?

Master It

10. [-/2 Points]

DETAILS

SCALCET9 5.2.AE.005.

Example 5[Video Example](#) 

Evaluate the following integrals by interpreting each in terms of areas.

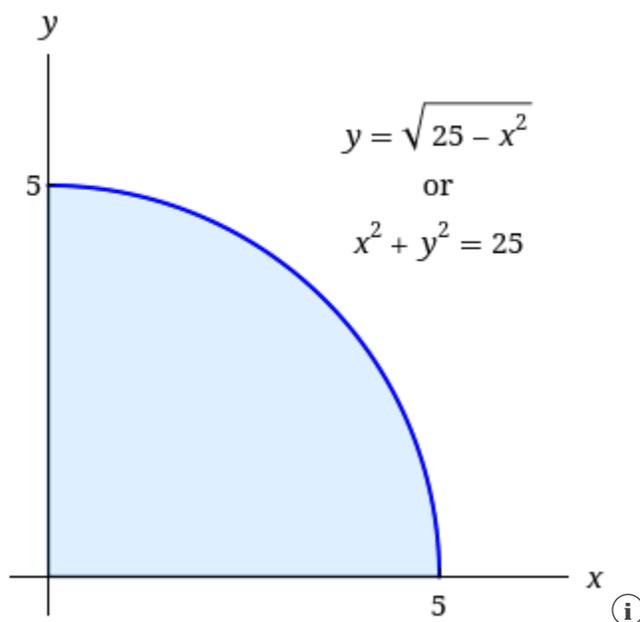
(a) $\int_0^5 \sqrt{25 - x^2} dx$

(b) $\int_0^9 (x - 3) dx$

Solution(a) Since $f(x) = \sqrt{25 - x^2} \geq 0$, we can interpret this integral as the area under the curve

$y^2 =$

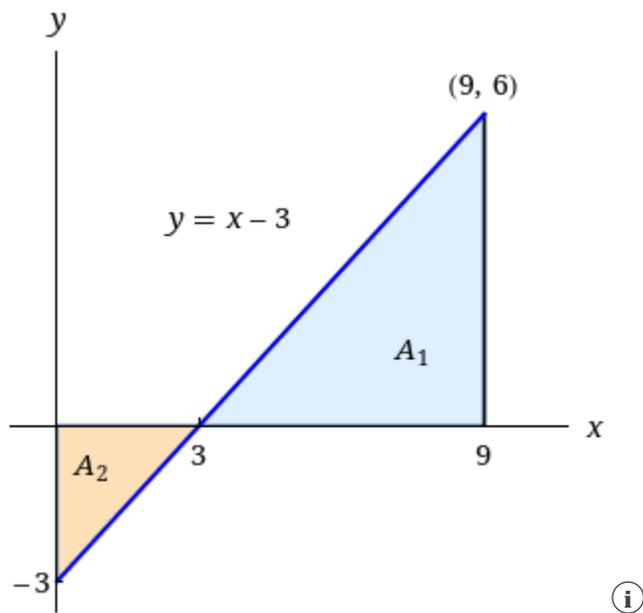
$y = \sqrt{25 - x^2}$ from 0 to . But, because , we get $x^2 + y^2 = 25$, which shows that the graph of f is the quarter-circle with radius in the figure below.



$$\int_0^5 \sqrt{25 - x^2} dx = \frac{1}{4}\pi(5)^2 =$$

Therefore, .

(b) The graph of $y = x - 3$ is the line with slope shown in the following figure.



We compute the integral as the difference of the areas of the two triangles.

$$\int_0^9 (x - 3) dx = A_1 - A_2 = \text{[]} - 4.5 = \text{[]}.$$