

Area and the Fundamental Theorem of Calculus

1. Sketch the region whose area is represented by the definite integral. Then use a geometric formula to evaluate the integral.
(Similar to p.348 #1-6)

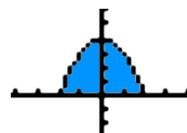
$$\int_0^2 6 \, dx$$

2. Sketch the region whose area is represented by the definite integral. Then use a geometric formula to evaluate the integral.
(Similar to p.348 #1-6)

$$\int_0^4 \frac{x}{4} \, dx$$

3. Find the area of the region by the Fundamental Theorem of Calculus.
(Similar to p.348 #9-16)

$$y = 4 - x^2$$



4. Evaluate the definite integral.
(Similar to p.348 #17-38)

$$\int_1^3 (x^2 - 2x + 3) \, dx$$

5. Evaluate the definite integral.
(Similar to p.348 #17-38)

$$\int_0^2 (3x - 1)^2 \, dx$$

6. Evaluate the definite integral.
(Similar to p.348 #17-38)

$$\int_1^4 \frac{2}{5x+3} dx$$

7. Evaluate the definite integral.
(Similar to p.348 #17-38)

$$\int_0^1 \frac{5}{\sqrt{8x+1}} dx$$

8. Evaluate the definite integral.
(Similar to p.348 #17-38)

$$\int_2^4 e^{9x-1} dx$$

9. Find the area of the region bounded by the graphs of the equations.
(Similar to p.349 #43-46)

$$y = 1 + \sqrt[3]{x}, y = 0, x = 0, \text{ and } x = 8$$

10. Find the change in cost C, revenue R, or profit P, for the given marginal. In each case, assume that the number of units x increases by 3 from the specified value of x
(Similar to p.349 #47-52)

$$\frac{dR}{dx} = 50 - 4x, x = 20$$

11. Find the average value of the function on the interval. Then find all x-values in the interval for which the function is equal to its average value
(Similar to p.349 #53-60)

$$f(x) = 9 - x^2; [0,3]$$

Average value of f on [a, b]

$$= \frac{1}{b-a} \int_a^b f(x) dx$$

12. Find the amount of an annuity with income function $c(t)$, interest rate r , and term T
(Similar to p.349 #67-70)

$$c(t) = \$900, r = 4\%, T = 3 \text{ years}$$

Amount of an annuity

$$= e^{rT} \int_0^T c(t) e^{-rt} dt$$

r = rate compounded continuously

T = term of the annuity in years

$c(t)$ = income function