

## EXERCISES for Section 5.1

In Exercises 1–6, complete the table using Table 5.1 as a model.

Given	Rewrite	Integrate	Simplify
1. $\int \sqrt[3]{x} dx$			
2. $\int \frac{1}{x^2} dx$			
3. $\int \frac{1}{x\sqrt{x}} dx$			
4. $\int x(x^2 + 3) dx$			
5. $\int \frac{1}{2x^3} dx$			
6. $\int \frac{1}{(2x)^3} dx$			

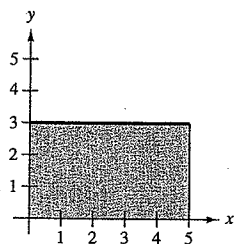
In Exercises 7–34, evaluate the indefinite integral and check your result by differentiation.

- |                                 |   |  |   |
|---------------------------------|---|--|---|
| 7. $\int (x^3 + 2) dx$          | 8. $\int (x^2 - 2x + 3) dx$                                 | 13. $\int \frac{1}{x^3} dx$                      | 14. $\int \frac{1}{x^4} dx$                   |
| 9. $\int (x^{3/2} + 2x + 1) dx$ | 10. $\int \left( \sqrt{x} + \frac{1}{2\sqrt{x}} \right) dx$ | 15. $\int \frac{1}{4x^2} dx$                     | 16. $\int (2x + x^{-1/2}) dx$                 |
| 11. $\int \sqrt[3]{x^2} dx$     | 12. $\int (\sqrt[4]{x^3} + 1) dx$                           | 17. $\int \frac{x^2 + x + 1}{\sqrt{x}} dx$       | 18. $\int \frac{x^2 + 1}{x^2} dx$             |
|                                 |   | 19. $\int (x + 1)(3x - 2) dx$                    | 20. $\int (2t^2 - 1)^2 dt$                    |
|                                 |   | 21. $\int \frac{t^2 + 2}{t^2} dt$                | 22. $\int (1 - 2y + 3y^2) dy$                 |
|                                 |   | 23. $\int y^2\sqrt{y} dy$                        | 24. $\int (1 + 3t)t^2 dt$                     |
|                                 |   | 25. $\int dx$                                    | 26. $\int 3 dt$                               |
|                                 |   | 27. $\int (2 \sin x + 3 \cos x) dx$              |   |
|                                 |   | 28. $\int (t^2 - \sin t) dt$                     |   |
|                                 |   | 29. $\int (1 - \csc t \cot t) dt$                | 30. $\int (\theta^2 + \sec^2 \theta) d\theta$ |
|                                 |   | 31. $\int (\sec^2 \theta - \sin \theta) d\theta$ | 32. $\int \sec y(\tan y - \sec y) dy$         |
|                                 |   | 33. $\int (\tan^2 y + 1) dy$                     | 34. $\int \frac{\sin x}{1 - \sin^2 x} dx$     |

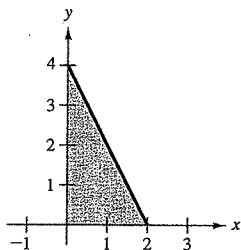
## EXERCISES for Section 5.3

In Exercises 1–10, set up a definite integral that yields the area of the given region. (Do not evaluate the integral.)

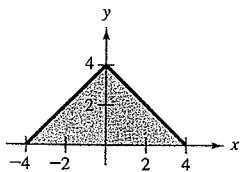
1.  $f(x) = 3$



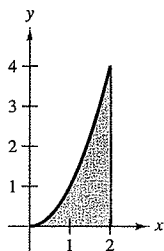
2.  $f(x) = 4 - 2x$



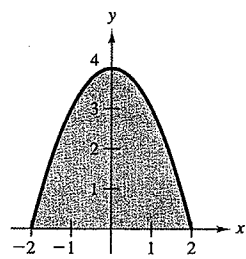
3.  $f(x) = 4 - |x|$



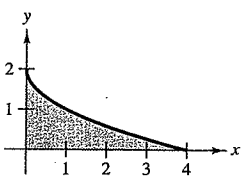
4.  $f(x) = x^2$



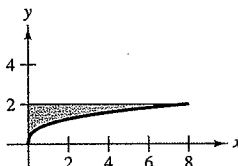
5.  $f(x) = 4 - x^2$



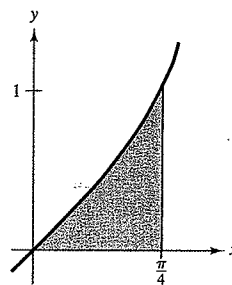
6.  $f(y) = (y - 2)^2$



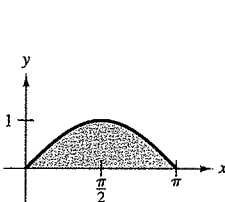
7.  $g(y) = y^3$



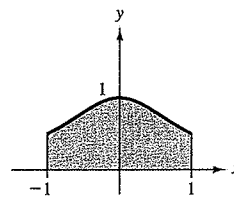
8.  $f(x) = \tan x$



9.  $f(x) = \sin x$



10.  $f(x) = \frac{1}{x^2 + 1}$



In Exercises 11–20, sketch the region whose area is indicated by the given definite integral. Then use a geometric formula to evaluate the integral ( $a > 0$ ,  $r > 0$ ).

11.  $\int_0^a 4 dx$

12.  $\int_{-a}^a 4 dx$

13.  $\int_0^4 x dx$

14.  $\int_0^4 \frac{x}{2} dx$

15.  $\int_0^2 (2x + 5) dx$

16.  $\int_0^5 (5 - x) dx$

17.  $\int_{-1}^1 (1 - |x|) dx$

18.  $\int_{-a}^a (a - |x|) dx$

19.  $\int_{-3}^3 \sqrt{9 - x^2} dx$

20.  $\int_{-r}^r \sqrt{r^2 - x^2} dx$