For the following problems, draw a diagram which represents the integral and find the integral from the area of the diagram.

In Exercises 7–12, evaluate the integral.

7. $\displaystyle\int_{-2}^{1} 5\, dx$ 15

8. $\displaystyle\int_{3}^{7} (-20)\, dx$ -80

9. $\displaystyle\int_{0}^{3} (-160)\, dt$ -480

10. $\displaystyle\int_{-4}^{-1} \frac{\pi}{2}\, d\theta$ $\dfrac{3\pi}{2}$

11. $\displaystyle\int_{-2.1}^{3.4} 0.5\, ds$ 2.75

12. $\displaystyle\int_{\sqrt{2}}^{\sqrt{18}} \sqrt{2}\, dr$ 4

In Exercises 13–22, use the graph of the integrand and areas to evaluate the integral.

13. $\displaystyle\int_{-2}^{4} \left(\frac{x}{2} + 3\right) dx$ 21

14. $\displaystyle\int_{1/2}^{3/2} (-2x + 4)\, dx$ 2

15. $\displaystyle\int_{-3}^{3} \sqrt{9 - x^2}\, dx$ $\dfrac{9\pi}{2}$

16. $\displaystyle\int_{-4}^{0} \sqrt{16 - x^2}\, dx$ 4π

17. $\displaystyle\int_{-2}^{1} |x|\, dx$ $\dfrac{5}{2}$

18. $\displaystyle\int_{-1}^{1} (1 - |x|)\, dx$ 1

19. $\displaystyle\int_{-1}^{1} (2 - |x|)\, dx$ 3

20. $\displaystyle\int_{-1}^{1} (1 + \sqrt{1 - x^2})\, dx$ $2 + \dfrac{\pi}{2}$

21. $\displaystyle\int_{\pi}^{2\pi} \theta\, d\theta$ $\dfrac{3\pi^2}{2}$

22. $\displaystyle\int_{\sqrt{2}}^{5\sqrt{2}} r\, dr$ 24

In Exercises 23–28, use areas to evaluate the integral.

23. $\displaystyle\int_0^b x\,dx, \quad b > 0 \qquad \frac{1}{2}b^2$

24. $\displaystyle\int_0^b 4x\,dx, \quad b > 0 \qquad 2b^2$

25. $\displaystyle\int_a^b 2s\,ds, \quad 0 < a < b \quad b^2 - a^2$

26. $\displaystyle\int_a^b 3t\,dt, \quad 0 < a < b \quad \frac{3}{2}(b^2 - a^2)$

27. $\displaystyle\int_a^{2a} x\,dx, \quad a > 0 \qquad \frac{3}{2}a^2$

28. $\displaystyle\int_a^{\sqrt{3}a} x\,dx, \quad a > 0 \qquad a^2$