

HW 4.4

Evaluate the definite integral of the algebraic function.

$$6. \int_2^7 3 \, dv$$

$$23. \int_0^3 |2x - 3| \, dx$$

$$7. \int_{-1}^0 (x - 2) \, dx$$

$$24. \int_1^4 (3 - |x - 3|) \, dx$$

$$10. \int_1^3 (3x^2 + 5x - 4) \, dx$$

$$27. \int_0^{\pi} (1 + \sin x) \, dx$$

$$13. \int_1^2 \left(\frac{3}{x^2} - 1 \right) \, dx$$

$$28. \int_0^{\frac{\pi}{4}} \frac{1 - \sin^2 \theta}{\cos^2 \theta} \, d\theta$$

$$16. \int_{-3}^3 v^{1/3} \, dv$$

$$31. \int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} 4 \sec \theta \tan \theta \, d\theta$$

$$20. \int_0^2 (2 - t) \sqrt{t} \, dt$$

Determine the area of the given region.

$$39. y = 3x^2 + 1, x = 0, x = 2, y = 0$$

$$40. y = 1 + \sqrt[3]{x}, x = 0, x = 8, y = 0$$

Find the value(s) for c guaranteed by the Mean Value Theorem for Integrals for the function over the given interval.

$$45. f(x) = 2 \sec^2 x, \left[-\frac{\pi}{4}, \frac{\pi}{4} \right]$$

Find the average value of the function over the given interval and all values of x in the interval for which the function equals its average value.

$$48. f(x) = \frac{4(x^2 + 1)}{x^2}, [1, 3]$$

$$49. f(x) = \sin x. [0, \pi]$$

Find F as a function of x and evaluate it at x=2, x=5 and x=8.

$$67. F(x) = \int_0^x (t - 5) dt$$

$$70. F(x) = \int_2^x (t^3 + 2t - 2) dt$$

$$71. F(x) = \int_1^x \cos \theta d\theta$$

In the following exercises, a) integrate to find F as a function of x and b) demonstrate the Second Fundamental Theorem of Calculus by differentiating the result in part a).

$$75. F(x) = \int_0^x (t + 2) dt$$

$$78. F(x) = \int_4^x \sqrt{t} dt$$

$$79. F(x) = \int_{\frac{\pi}{4}}^x \sec^2 t dt$$

Use the Second Fundamental Theorem of Calculus to find F'(x).

$$82. F(x) = \int_1^x \frac{t^2}{t^2 + 1} dt$$

$$83. F(x) = \int_{-1}^x \sqrt{t^4 + 1} dt$$

$$86. F(x) = \int_0^x \sec^3 t dt$$