

5.4.22 Find the general indefinite integral.

$$\int \sec t(\sec t + \tan t) dt$$

5.4.54 Evaluate the definite integral.

$$\int_0^{\frac{3\pi}{2}} |\sin x| dx$$

5.4.72 The acceleration function $a(t)$ in m/s^2 and the initial velocity $v(0)$ are given for a particle moving along a line. Find (a) the velocity at time t and (b) the distance traveled during the given time interval.

$$a(t) = 2t + 3, \quad v(0) = -4, \quad 0 \leq t \leq 3.$$

5.4.77 The marginal cost of manufacturing x yards of a certain fabric is

$$C'(x) = 3 - 0.01x + 0.000006x^2$$

(in dollars per yard). Find the increase in cost if the production level is raised from 2000 yards to 4000 yards.

5.5.80 Evaluate the definite integral.

$$\int_1^{16} \frac{x^{\frac{1}{2}}}{1+x^{\frac{3}{4}}} dx$$

5.5.83 Evaluate

$$\int_{-2}^2 (x+3)\sqrt{4-x^2} dx$$

by writing it as a sum of two integrals and interpreting one of those integrals in terms of an area.

5.5.94 If f is continuous and $\int_0^9 f(x)dx = 4$, find $\int_0^3 xf(x^2)dx$.

5.5.98 If f is continuous on $[0, \pi]$, use the substitution $u = \pi - x$ to show that

$$\int_0^\pi xf(\sin x)dx = \frac{\pi}{2} \int_0^\pi f(\sin x)dx.$$

5.5.99 Use 5.5.98 to evaluate the integral

$$\int_0^\pi \frac{x \sin x}{1 + \cos^2 x} dx.$$