

## Chapter 5 Practice Test

Find the indefinite integral.

1.  $\int (2x^2 + 1)^2 dx$

2.  $\int \sin(4x - 3) dx$

3.  $\int (5e^x) dx$

4.  $\int 3x^2 \sqrt{4 + x^3} dx$

5.  $\int \frac{1}{8x + 1} dx$

6.  $\int \cot 2\theta dx$

7.  $\int \frac{4}{9 + 4x^2} dx$

8.  $\int \frac{x^3 + 1}{x^2} dx$

9.  $\int \frac{6}{x} dx$

10.  $\int x^2 e^{x^3} dx$

11. Use the given values to evaluate each definite integral. If  $\int_0^4 f(x) dx = 7$  and  $\int_4^{10} f(x) dx = -3$ , find:

a.  $\int_0^{10} f(x) dx$

c.  $\int_5^5 f(x) dx$

b.  $\int_4^0 f(x) dx$

d.  $\int_0^4 (f(x) + 3) dx$

Evaluate the definite integrals.

12.  $\int_0^{\pi/2} \cos x dx$

15.  $\int_{-5}^5 \frac{t^3}{2} dt$

13.  $\int_{-1}^2 x(1-x^2)^3 dx$

16.  $\int_0^1 \frac{dx}{\sqrt{25-9x^2}}$

14.  $\int_2^5 \frac{3x^2 - 2x}{x^3 - x^2} dx$

17.  $\int_{-2}^2 \frac{dx}{x^2 + 4x + 13}$

18. Find the particular solution of the equation for  $y$  given  $y' = 4x^3 + 2x$ . The curve goes through  $(1,0)$ .

19. Find the average  $y$  value of the function over the given interval. Find the  $x$  value that has this  $y$  value.

$$f(x) = (x - 1)^2 + 2 \quad [1, 4]$$

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

20. Use the Trapezoidal Rule to approximate the value of the definite integral for the function below.  
Let  $n = 4$ . Round your answer to 4 decimal places.

$$\int_0^4 (x-1)^2 + 2 \, dx$$

$$Area = \frac{\text{width}}{2} [\text{first} + \text{last} + 2(\text{sum of middles})]$$

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

$$F(x) = \int_{-1}^x 7\sqrt[3]{t-4} \, dt$$