

MAC2312  
Suggested problems on Chapter 7 material  
(techniques of integration)

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1. Evaluate the integral.

$$\int x \sec^2(x^2) dx$$

2. Evaluate the integral.

$$\int \frac{\sin 3x}{2 + \cos 3x} dx$$

3. Evaluate the integral.

$$\int x^2 e^x dx$$

4. Evaluate the integral.

$$\int (\ln x)^2 dx$$

5. Evaluate the integral.

$$\int e^x \sin x \, dx$$

6. Evaluate the integral.

$$\int \sin(\ln x) dx$$

7. Evaluate the integral.

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

8. Evaluate the integral.

$$\int_1^e x^3 e^{x^2} dx$$



9. Evaluate the integral.

$$\int_1^e x^2 \ln x \, dx$$

10. Evaluate the integral.

$$\int \sin^2 t \cos^3 t \, dt$$

11. Evaluate the integral.

$$\int \sin^3 x \cos^2 x \, dx$$

12. Evaluate the integral.

$$\int \sin^2 x \cos^2 x \, dx$$

**13.** Evaluate the integral.

$$\int \sin 2x \cos 3x \, dx$$

14. Evaluate the integral.

$$\int_0^{\pi/2} \cos^3 x \, dx$$

15. Evaluate the integral.

$$\int e^{-x} \tan(e^{-x}) dx$$

**16.** Evaluate the integral.

$$\int \tan^2 x \sec^2 x \, dx$$



17. Evaluate the integral.

$$\int \sec^5 x \tan^3 x \, dx$$

18. Evaluate the integral.

$$\int \sqrt{4 - x^2} \, dx$$

19. Evaluate the integral.

$$\int \frac{x^2}{\sqrt{16-x^2}} dx$$

20. Evaluate the integral.

$$\int \frac{1}{(4+x^2)^2} dx$$

**21.** Evaluate the integral.

$$\int \frac{\sqrt{x^2 - 9}}{x} dx$$

**22.** Evaluate the integral.

$$\int \frac{1}{x^2\sqrt{x^2-16}} dx$$

**23.** Evaluate the integral.

$$\int \frac{1}{(1-x^2)^{3/2}} dx$$

24. Find the arc length of the curve  $y = \ln x$  from  $x = 1$  to  $x = 2$ .



25. Evaluate the integral.

$$\int \frac{1}{x^2 - 4x + 5} dx$$