

Products of Powers of Sines and Cosines

Evaluate the integrals in Exercises 1–14.

1. $\int_0^{\pi/2} \sin^5 x \, dx$

2. $\int_0^{\pi} \sin^5 \frac{x}{2} \, dx$

3. $\int_{-\pi/2}^{\pi/2} \cos^3 x \, dx$

4. $\int_0^{\pi/6} 3 \cos^5 3x \, dx$

5. $\int_0^{\pi/2} \sin^7 y \, dy$

6. $\int_0^{\pi/2} 7 \cos^7 t \, dt$

7. $\int_0^{\pi} 8 \sin^4 x \, dx$

8. $\int_0^1 8 \cos^4 2\pi x \, dx$

9. $\int_{-\pi/4}^{\pi/4} 16 \sin^2 x \cos^2 x \, dx$

10. $\int_0^{\pi} 8 \sin^4 y \cos^2 y \, dy$

11. $\int_0^{\pi/2} 35 \sin^4 x \cos^3 x \, dx$

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

13. $\int_0^{\pi/4} 8 \cos^3 2\theta \sin 2\theta \, d\theta$

14. $\int_0^{\pi/2} \sin^2 2\theta \cos^3 2\theta \, d\theta$

Integrals with Square Roots

Evaluate the integrals in Exercises 15–22.

$$15. \int_0^{2\pi} \sqrt{\frac{1 - \cos x}{2}} dx$$

$$16. \int_0^{\pi} \sqrt{1 - \cos 2x} dx$$

$$17. \int_0^{\pi} \sqrt{1 - \sin^2 t} dt$$

$$18. \int_0^{\pi} \sqrt{1 - \cos^2 \theta} d\theta$$

$$19. \int_{-\pi/4}^{\pi/4} \sqrt{1 + \tan^2 x} dx$$

$$20. \int_{-\pi/4}^{\pi/4} \sqrt{\sec^2 x - 1} dx$$

$$21. \int_0^{\pi/2} \theta \sqrt{1 - \cos 2\theta} d\theta$$

$$22. \int_{-\pi}^{\pi} (1 - \cos^2 t)^{3/2} dt$$

Powers of Tan x and Sec x

Evaluate the integrals in Exercises 23–32.

$$23. \int_{-\pi/3}^0 2 \sec^3 x dx$$

$$24. \int e^x \sec^3 e^x dx$$

$$25. \int_0^{\pi/4} \sec^4 \theta d\theta$$

$$26. \int_0^{\pi/12} 3 \sec^4 3x dx$$

$$27. \int_{\pi/4}^{\pi/2} \csc^4 \theta d\theta$$

$$28. \int_{\pi/2}^{\pi} 3 \csc^4 \frac{\theta}{2} d\theta$$

$$29. \int_0^{\pi/4} 4 \tan^3 x dx$$

$$30. \int_{-\pi/4}^{\pi/4} 6 \tan^4 x dx$$

$$31. \int_{\pi/6}^{\pi/3} \cot^3 x dx$$

$$32. \int_{\pi/4}^{\pi/2} 8 \cot^4 t dt$$

Products of Sines and Cosines

Evaluate the integrals in Exercises 33–38.

$$33. \int_{-\pi}^0 \sin 3x \cos 2x dx$$

$$34. \int_0^{\pi/2} \sin 2x \cos 3x dx$$

$$35. \int_{-\pi}^{\pi} \sin 3x \sin 3x dx$$

$$36. \int_0^{\pi/2} \sin x \cos x dx$$

$$37. \int_0^{\pi} \cos 3x \cos 4x dx$$

$$38. \int_{-\pi/2}^{\pi/2} \cos x \cos 7x dx$$