1. Evaluate:

$$\int \frac{9}{\sqrt{64-81x^2}}dx$$

2. Compute $\frac{dy}{dx}$ for the function:

$$y = \sinh 7x$$

3. Compute $\frac{dy}{dx}$ for the function:

$$y = \sinh^2 4x$$

4. Evaluate:

$$\int -\operatorname{csch}^2 x \coth x \; dx$$

5. Evaluate:

$$\int_0^{\ln 2} \cosh x \; dx$$

6. Evaluate the following without use of a calculator:

$$\coth(\ln 6)$$

7. Determine if the given function y is a solution of the differential equation y''. Assume that C is an arbitrary constant.

$$y = C_1 \sin 5t + C_2 \cos 5t; \quad y''(t) + 25y = 0$$

8. Find the general solution of the equation:

$$y'(t) - \frac{y}{16} = -11$$

9. Evaluate:

$$\int \frac{-\csc\theta}{\csc\theta - \cot\theta}d\theta$$

10. Evaluate:

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

11. Evaluate:

$$\int_2^4 8x \ln x \; dx$$

12. Use integration by parts to establish a reduction formula for the integral:

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

13. Evaluate:

$$\int_0^{\pi/4} \sin^3 4x \; dx$$

14. Evaluate:

$$\int \cos^2 \theta \sin 2\theta \; d\theta$$