1. Evaluate \( \int \frac{\cos x}{\sin^3 x} \, dx \)

2. Evaluate \( \int \arctan x \, dx \)

3. Evaluate \( \int x \ln x \, dx \)

4. Evaluate \( \int \frac{x+1}{x^2+2x-3} \, dx \)

5. Find the volume of the solid obtained by revolving the region bounded by \( y = x \) and \( y = \sqrt{x} \) about the \( x \)-axis. Sketch the region and the solid.

6. Let \( R \) be the region bounded by \( y = \frac{\ln x}{x} \), \( x = 1 \), \( x = e \), and \( y = 0 \). Sketch \( R \) and find the volume of the solid obtained by revolving \( R \) about the \( y \)-axis.

7. Evaluate \( \int e^{\sqrt{x}} \, dx \)
   Hint: use two integration techniques successively.

8. Evaluate \( \int \sqrt{1 - x^2} \, dx \)
   by making the trigonometric substitution \( x = \cos \theta \).

9. Evaluate \( \int_0^\pi \cos^4 x \, dx \)

10. Evaluate \( \int \frac{1}{x^2+x-2} \, dx \)

11. Evaluate \( \int \frac{x}{(x-1)^2} \, dx \)

12. Evaluate \( \frac{d}{dx} \int_0^{\sqrt{x}} e^{-t^2} \, dt \)

13. Find the area under the curve \( y = \ln x \) between \( x = 1 \) and \( x = e \).