1. Compute $\int \frac{4}{\sqrt{4+25t^2}}\,dt$
2. Compute $\int x^3 \ln x^2 \; dx$
3. Compute $\int \frac{1}{x^2+6x+10}\,dx$
4. Compute $\int \frac{1}{x^3\sqrt{x^2-1}}\,dx$ for $x > 1$.
5. Compute $\int \frac{\sec x}{4-3\tan x}\,dx$
6. Compute $\int 3x\sin(2x) \; dx$
7. Compute $\int e^{\sqrt{x}} \; dx$
8. Compute $\int \frac{dx}{x^2\sqrt{x^2+1}}$
9. Compute $\int \frac{3x+4}{\sqrt{x+1}}\,dx$
10. Compute $\int \cos(\ln x)) \; dx$
11. Compute $\int \sqrt{x(6-x)}\,dx$
12. Compute $\int \frac{1}{3+2\cos x}\,dx$
13. Compute $\int \frac{dx}{\cos x + \sin x}$
14. Compute $\int \frac{\sqrt{1-x^2}}{x^4}\,dx$
15. Compute $\int \frac{dx}{\sin(2x)}$
16. Compute $\int \sqrt{2x+3}\,dx$
17. Compute $\int \frac{1}{\sqrt[4]{x}+\sqrt[3]{x}}\,dx$
18. Compute $\int x^3\sin(x^2)\,dx$
19. Compute $\int \ln(x+\sqrt{x^2-1})\,dx$
20. Compute $\int \frac{1}{t^3+8}\,dt$
21. Compute $\int \frac{x-1}{\sqrt{x^2-4x+3}}\,dx$
22. Compute $\int_{\ln(3/4)}^{\ln(4/3)} \frac{e^t}{(1+e^{2t})^{(3/2)}}\,dt$
23. Compute $\int \frac{\cos x}{2-\sin x}\,dx$
24. Compute $\int \frac{3x^4-11x^3-20x^2+13x-51}{(x-5)(x+2)}\,dx$
25. Compute $\int \frac{x+1}{x^2(x-1)}\,dx$
26. Compute $\int \frac{x}{(16-x^2)^2}\,dx$
27. Compute $\int \frac{1}{(16-x^2)^2}\,dx$
28. Compute $\int \frac{-2-x+2x^2}{(-1+x)x^2}\,dx$
29. Compute $\int \frac{dx}{2+\tan x}$
30. Compute $\int x^3 e^{x^2}\,dx$
31. Compute $\int \sqrt{\sin t}\cos^3 t\,dt$

32. Compute $\displaystyle\int \frac{4x^2+54x+134}{(x-1)(x^2+8x+15)}\,dx$

33. Compute $\displaystyle\int \sqrt{x}e^{\sqrt{x}}\,dx$

34. Compute $\displaystyle\int \sec^5 x\,dx$

35. Compute $\displaystyle\int \frac{1+\sin(x)}{1+\cos(x)}\,dx$

36. Compute $\displaystyle\int \frac{1}{\sqrt{9-(x-2)^2}}\,dx$

37. Compute $\displaystyle\int \tan^6 x\,dx$

38. Compute $\displaystyle\int \frac{1}{x\sqrt{4-x^2}}\,dx$

39. Compute $\displaystyle\int \frac{x^2}{(x^2+8)\sqrt{x^2+8}}\,dx$

40. Compute $\displaystyle\int \sqrt{x}\ln(x)\,dx$

41. Compute $\displaystyle\int \frac{2+9x+5x^2+2x^3}{(3+2x+x^2)^2}\,dx$

42. Derive the formula for the area of an ellipse. Recall that an ellipse has an equation of the form $\dfrac{x^2}{a^2}+\dfrac{y^2}{b^2}=1$.

43. The area bounded by the x–axis and the function $y=\sin(x)$ for $0\le x\le\pi$ is rotated about the y–axis. Find the volume.

44. Compute the length of the arc whose equation is $y=x^3$ for $0\le x\le 2$.