1. Compute $\displaystyle\int \left(4e^{6z} + \frac{3}{z^3} + \frac{5}{1+z^2}\right) dz$.

   Solution. $\displaystyle\frac{2e^{6z}}{3} - \frac{3}{2}z^{-2} + 5\arctan z$.

2. Compute $\displaystyle\int_1^2 \left(\frac{3x^5 - 1}{x^2}\right) dx$.

   Solution. $\displaystyle\frac{43}{4}$.

3. Compute $\displaystyle\int \frac{\cos(2\sqrt{y})}{\sqrt{y}} dy$.

   Solution. $\sin(2\sqrt{y})$.

4. Compute $\displaystyle\int_0^3 (2+v)^3\, dv$.

   Solution. $\displaystyle\frac{5^4 - 16}{4}$.

5. Compute $\displaystyle\int 7\arctan(8w)\, dw$.

   Solution. $\displaystyle 7w\arctan(8w) - \frac{7}{16}\ln\left(1 + 64w^2\right)$.

6. Compute $\displaystyle\int \frac{-2x + 3}{x^2 + 3x - 4}\, dx$.

   Solution. $\displaystyle\frac{1}{5}\ln|x-1| - \frac{11}{5}\ln|x+4|$.

7. Compute $\displaystyle\int \frac{14z - 5}{z^2 + 4z + 20}\, dz$.

   Solution. $\displaystyle 7\ln\left|(z+2)^2 + 16\right| - \frac{33}{4}\arctan\left(\frac{z+2}{4}\right)$.