1. Integrate $\displaystyle\int (x+1)\ln(x^2)\,dx$.

2. Integrate $\displaystyle\int (2x+1)\ln(x^2+x)\,dx$.

3. Find the length of the curve $y = \dfrac{x^3}{12} + \dfrac{1}{x}$, $1 \le x \le 4$.

4. A jellybean cross-section through the middle is an oval with equation

$$9x^2 + 4y^2 = 36.$$

Find the volume of the jellybean.

5. Integrate $\displaystyle\int \frac{dx}{x\sqrt{1+(\ln x)^2}}$.

6. Integrate $\displaystyle\int x^3\sqrt{1-x^2}\,dx$.

7. The force required to move a heavy box decreases rapidly once the box starts moving. The force needed is

$$F(x) = \frac{1}{e^x - e^{-x}}$$

where $x \ge 1$ is the distance from start (we ignore the first 1 unit of movement). Find the work needed to move the box from $x = 1$ to $x = \ln 10$.

8. Integrate $\displaystyle\int \frac{x+1}{(x+2)^2}\,dx$.

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

10. Integrate $\displaystyle\int \frac{x+4}{x^2+5x-6}\,dx$.