

Practice with Algebra and Integrals

Here are some practice problems of the type you might find useful. For integration by parts, try to use the table version- it can make the problem go much faster!

Practice with Partial Fractions

1. $\int \frac{2x^2 - x + 4}{x^3 + 4x} dx$

3. $\int \frac{x-1}{x^2+1} dx$

2. $\int \frac{1}{y(2-y)} dy$

4. $\int \frac{dx}{x^4 - x^2}$

Practice with Integration by Parts

1. $\int e^{2\theta} \sin(3\theta) d\theta$

3. $\int x^3 e^x dx$

2. $\int t^2 \cos(3t) dt$

4. $\int \tan^{-1}(x) dx$

Algebra practice with logs and exponentials

1. Write each expression in logarithmic form

(a) $a^b = c$

(b) $100^{1/2} = 10$

(c) $(3/4)^{-1} = 4/3$

(d) $2^5 = 32$

2. Write each expression in exponential form

(a) $\log_a(b) = c$

(b) $\log_{10}(0.001) = -3$

(c) $\log_2(\sqrt{32}) = 5/2$

3. Solve each equation:

(a) $10^{2r-3} = 17$

(c) $(1/2)^{3k+1} = 3$

(b) $\log_2(y+3) = 5$

(d) $\ln(6x) - \ln(x+1) = \ln(4)$

4. Use properties of logs to write each as a sum, difference or product of logarithms:

(a) $\log_3\left(\frac{mn}{5r}\right)$

(b) $\log_2\left(\frac{\sqrt{7}}{15}\right)$

(c) $\log_5\left(x^2 y^4 \sqrt[5]{m^3 p}\right)$

(d) $\log_7(7k + 5r^2)$

5. Simplify: $e^{a \ln(b)}$