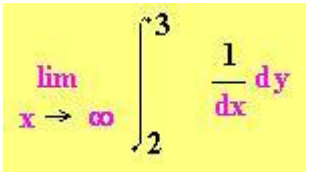

INDEFINITE INTEGRALS AND ANTIDERIVATIVES OF SOME ALGEBRAIC FUNCTIONS

Prepared by Ingrid Stewart, Ph.D., College of Southern Nevada
Please Send Questions and Comments to ingrid.stewart@csn.edu. Thank you!

Problem 1:

Integrate $\int (4x^2 - 8x + 1)\,dx$. Note that "integrate" actually means to find the antiderivative for the function $f(x) = 4x^2 - 8x + 1$!!!

Problem 2:

Evaluate $\int \left(\frac{4}{z^6} - \frac{7}{z^4} + z \right) dz$. Note that "evaluate" actually means to find the antiderivative for the function $f(x) = \frac{4}{z^6} - \frac{7}{z^4} + z$!!!

Problem 3:

Evaluate $\int (\sqrt{u^3} - \sqrt[5]{u} + 6)\,du$.

Problem 4:

Evaluate $\int \left(x - \frac{1}{x} \right)^2 dx$.

Problem 5:

Evaluate $\int (2x - 5)(3x + 1)\,dx$

Problem 6:

Evaluate $\int \frac{2x^2 - x + 3}{\sqrt{x}}\,dx$.

Problem 7:

Solve the differential equation $f'(x) = 9x^2 + x - 8$ subject to the initial condition $f(0) = 2$.

Problem 8:

Solve the differential equation $f''(x) = 6x - 4$ subject to the initial conditions $f'(2) = 5$ and $f(2) = 4$.

SOLUTIONS

You can find detailed solutions below the link for this problem set!

1. $F(x) = \frac{4}{3}x^3 - 4x^2 + x + C$	2. $F(z) = \frac{4}{5z^5} + \frac{7}{3z^3} + \frac{1}{2}z^2 + C$
3. $F(u) = \frac{2}{5}u^{5/2} - \frac{5}{6}u^{6/5} + 6u + C$	4. $F(x) = \frac{1}{3}x^3 - 2x - \frac{1}{x} + C$
5. $F(x) = 2x^3 - \frac{13}{2}x^2 - 5x + C$	6. $F(x) = \frac{4}{5}x^{5/2} - \frac{2}{3}x^{3/2} + 6x^{1/2} + C$
7. $f(x) = 3x^3 + \frac{1}{2}x^2 - 8x + 2$	8. $f(x) = x^3 - 2x^2 + x + 2$