

201-203-RE - Practice Set #1: Basic Indefinite Integrals

Evaluate the following integrals.

$$(1) \int \frac{14 - 2\sqrt{x} + 3xe^x}{7x} dx$$

$$(7) \int \frac{6\sqrt[5]{x^2} + 3\sqrt[3]{x^4} - 8x^4}{2\sqrt{x}} dx$$

$$(13) \int (2x^2 + 9)^2 dx$$

$$(2) \int \frac{4\sqrt[4]{x} - 5\sqrt{x} + 4x^3}{\sqrt[3]{x}} dx$$

$$(8) \int \frac{9x^5 - 12\sqrt[3]{x}}{30\sqrt{x^5}} dx$$

$$(14) \int (3\sqrt{x} + 4x)^2 dx$$

$$(3) \int \frac{6\sqrt{x} - 5x^2}{30\sqrt[3]{x}} dx$$

$$(9) \int (8\sqrt[4]{x} + 2x^2)^2 dx$$

$$(4) \int (4\sqrt{x} - 3x^3)^2 dx$$

$$(10) \int \frac{(3x^2 - \sqrt[3]{x})^2}{3x^2} dx$$

$$(15) \int [4x - \sqrt[3]{x}(2x - 5x^2)] dx$$

$$(5) \int \frac{(5x + 3\sqrt{x})^2}{x^2} dx$$

$$(11) \int (3x^{-1} + 4)^2 dx$$

$$(6) \int \frac{\sqrt[5]{x} + x^3e^x + 6x^5}{3x^3} dx$$

$$(12) \int \sqrt[3]{x}(3x - 2\sqrt{x} + 6) dx$$

$$(16) \int \frac{(3 + 5x)(x^2 + 1)^2}{2x} dx$$

**ANSWERS:**

$$(1) 2 \ln |x| - \frac{4}{7}\sqrt{x} + \frac{3}{7}e^x + C$$

$$(9) \frac{128}{3}x^{3/2} + \frac{128}{13}x^{13/4} + \frac{4}{5}x^5 + C$$

$$(2) \frac{48}{11}x^{11/12} - \frac{30}{7}x^{7/6} + \frac{12}{11}x^{11/3} + C$$

$$(10) \frac{-1}{x^{1/3}} - \frac{3}{2}x^{4/3} + x^3 + C$$

$$(3) \frac{6}{35}x^{7/6} - \frac{1}{16}x^{8/3} + C$$

$$(11) \frac{-9}{x} + 24 \ln |x| + 16x + C$$

$$(4) 8x^2 - \frac{16}{3}x^{9/2} + \frac{9}{7}x^7 + C$$

$$(12) \frac{9}{7}x^{7/3} - \frac{12}{11}x^{11/6} + \frac{9}{2}x^{4/3} + C$$

$$(5) 25x + 60\sqrt{x} + 9 \ln |x| + C$$

$$(13) \frac{4}{5}x^5 + 12x^3 + 81x + C$$

$$(6) \frac{-5}{27x^{9/5}} + \frac{1}{3}e^x + \frac{2}{3}x^3 + C$$

$$(14) \frac{9}{2}x^2 + \frac{48}{5}x^{5/2} + \frac{16}{3}x^3 + C$$

$$(7) \frac{10}{3}x^{9/10} + \frac{9}{11}x^{11/6} - \frac{8}{9}x^{9/2} + C$$

$$(15) 2x^2 - \frac{6}{7}x^{7/3} + \frac{3}{2}x^{10/3} + C$$

$$(8) \frac{3}{35}x^{7/2} + \frac{12}{35x^{7/6}} + C$$

$$(16) \frac{1}{2}x^5 + \frac{3}{8}x^4 + \frac{5}{3}x^3 + \frac{3}{2}x^2 + \frac{5}{2}x + \frac{3}{2} \ln |x| + C$$