Basic Integrals **Version A**
Rensselaer Calculus Skills Practice Page

No calculators will be allowed and no partial credit will be given.

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1. Express the indefinite integral $\int t^{\frac{3}{2}}\,dt$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
2. Express the indefinite integral $\int \left(x^4 + 5\,x^2 + 3\right)\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
3. Express the indefinite integral $\int 2\,\sin(t)\,dt$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
4. Express the indefinite integral $\int \left(3\,\cos(x) + 7\,e^x\right)\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
5. Express the indefinite integral $\int \frac{3}{x^{\frac{5}{3}}}\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
6. Express the indefinite integral $\int x\,\left(3\,x^2 + 5\right)\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
7. Express the indefinite integral $\int \frac{4\,x^4 + 7\,x^3 + 3}{x}\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
8. Express in simplified form the value of $\int_0^1 \left(2\,x + 2\right)\,dx$.
9. Express in simplified form the value of $\int_0^1 \left(4\,x^2 + 4\,x - 2\right)\,dx$.
10. Express in simplified form the value of $\int_0^1 \left(x^{\frac{2}{3}} + 2\,\sqrt{x}\right)\,dx$.
11. Evaluate $\int_1^2 \frac{1}{x^{2/3}}\,dx$. Express your answer in simplified form.

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Answer Key Rensselaer Calculus Skills Practice Page, Fall 2007

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1. $\dfrac{2\,t^{\frac{5}{2}}}{5} + C$
2. $\dfrac{x^5}{5} + \dfrac{5\,x^3}{3} + 3\,x + C$
3. $-2\,\cos(t) + C$
4. $3\,\sin(x) + 7\,e^x + C$
5. $-\dfrac{9}{2\,x^{\frac{2}{3}}} + C$
6. $\dfrac{3\,x^4}{4} + \dfrac{5\,x^2}{2} + C$
7. $3\,\ln(|x|) + x^4 + \dfrac{7\,x^3}{3} + C$
8. 3
9. $\dfrac{4}{3}$
10. $\dfrac{29}{15}$
11. $3 \cdot 2^{\frac{1}{3}} - 3$