Review of Calculus I Integrals (Section 1) **Version B**
Rensselaer Calculus Skills Practice Page

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

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

16. Express the indefinite integral $\int -3\,(\sec(t))^3\,\tan(t)\,dt$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.

17. Express the indefinite integral $\int \frac{14\,x+2}{7\,x^2+2\,x}\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.

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Answer Key Rensselaer Calculus Skills Practice Page, Fall 2007

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1. $\frac{29}{20}$
2. $3 \cdot \ln(2) + 5$
3. $5 \cdot \ln(2) + \frac{28}{3}$
4. $x^4 + \frac{7\,x^2}{2} + C$
5. $6\,e^x - 3\,\cos(x) + C$
6. $3\,\ln(|x|) + \frac{2\,x^5}{5} + \frac{7\,x^4}{4} + C$
7. $-\frac{26}{15}$
8. $-\frac{3}{4}$
9. $\frac{2}{5}$
10. $-2\,\cos\left(x^{\frac{3}{2}} + 1\right) + C$
11. $-\frac{\sin(5\,x)}{5} + C$
12. $\frac{\left(x^2 - 4\,x + 2\right)^4}{4} + C$
13. $-\frac{5\,e^{-x^2}}{2} + C$
14. $\frac{7}{2} - \frac{7 \cdot e^{-1}}{2}$
15. $\frac{3\,(\cos(t))^7}{7} + C$
16. $-\frac{1}{(\cos(t))^3} + C$
17. $\ln\left(\left|7\,x^2 + 2\,x\right|\right) + C$