Integration by Parts (Section 2) **Version D**
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 $\int 5\,x^3\,\ln(x)\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
2. Express in simplified form the value of $\int_1^{e^2} 2\,x^2\,\ln(x)\,dx$.
3. Express the indefinite integral $\int 5\,x\,e^x\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
4. Express in simplified form the value of $\int_0^2 3\,x\,e^{3\,x}\,dx$.
5. Express the indefinite integral $\int 3\,\ln(6\,t)\,dt$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
6. Express the indefinite integral $\int x^{\frac{1}{4}}\,\ln(x)\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
7. Express the indefinite integral $\int 2\,x^2\,e^{-x}\,dx$ in terms of elementary functions. Use the symbol C to denote an arbitrary constant.
8. Express in simplified form the value of $\int_0^2 5\,x^2\,e^{-3\,x}\,dx$.
9. Express in simplified form the value of $\int_1^{e^2} \frac{\ln(x)}{x^{\frac{1}{4}}}\,dx$.

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Answer Key Rensselaer Calculus Skills Practice Page, Fall 2007

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1. $5\left(\dfrac{x^4\,\ln(x)}{4}-\dfrac{x^4}{16}\right)+C$
2. $\dfrac{10\cdot e^6}{9}+\dfrac{2}{9}$
3. $5\,x\,e^x-5\,e^x+C$
4. $\dfrac{5\cdot e^6}{3}+\dfrac{1}{3}$
5. $3\,t\,\ln(6\,t)-3\,t+C$
6. $\dfrac{4\,x^{\frac{5}{4}}\,\ln(x)}{5}-\dfrac{16\,x^{\frac{5}{4}}}{25}+C$
7. $-2\,x^2\,e^{-x}-4\,x\,e^{-x}-4\,e^{-x}+C$
8. $\dfrac{10}{27}-\dfrac{250\cdot e^{-6}}{27}$
9. $\dfrac{8\cdot e^{\frac{3}{2}}}{9}+\dfrac{16}{9}$