

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

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

1.  $-(\ln(x))^2 + C$

2.  $\frac{4}{9} - \frac{28 \cdot e^{-6}}{9}$

3.  $\frac{3xe^{-4x}}{4} + \frac{3e^{-4x}}{16} + C$

4.  $\frac{3 \cdot e^{-2}}{2} - \frac{5 \cdot e^{-4}}{2}$

5.  $4t \ln(3t) - 4t + C$

6.  $\frac{2x^{\frac{3}{2}} \ln(x)}{3} - \frac{4x^{\frac{3}{2}}}{9} + C$

7.  $2x^2 e^{2x} - 2x e^{2x} + e^{2x} + C$

8.  $\frac{5 \cdot e^{-2}}{2} - \frac{13 \cdot e^{-4}}{2}$

9.  $\frac{14 \cdot e^{\frac{9}{2}}}{9} + \frac{4}{9}$