Preface

Here are a set of practice problems for my Calculus I notes. If you are viewing the pdf version of this document (as opposed to viewing it on the web) this document contains only the problems themselves and no solutions are included in this document. Solutions can be found in a number of places on the site.

1. If you'd like a pdf document containing the solutions go to the note page for the section you'd like solutions for and select the download solutions link from there. Or,

2. Go to the download page for the site http://tutorial.math.lamar.edu/download.aspx and select the section you'd like solutions for and a link will be provided there.

3. If you'd like to view the solutions on the web or solutions to an individual problem you can go to the problem set web page, select the problem you want the solution for. At this point I do not provide pdf versions of individual solutions, but for a particular problem you can select "Printable View" from the "Solution Pane Options" to get a printable version.

Note that some sections will have more problems than others and some will have more or less of a variety of problems. Most sections should have a range of difficulty levels in the problems although this will vary from section to section.

Substitution Rule for Indefinite Integrals

For problems 1 – 16 evaluate the given integral.

1. $\int (8x-12)(4x^2-12x)^4 \, dx$

2. $\int 3t^{-4}(2+4t^{-3})^{-7} \, dt$

3. $\int (3-4w)(4w^2-6w+7)^{10} \, dw$

4. $\int 5(z-4) \sqrt[3]{z^2-8z} \, dz$

5. $\int 90x^2 \sin(2+6x^3) \, dx$

6. $\int \sec(1-z)\tan(1-z)\,dz$

7. $\int \left(15t^{-2} - 5t\right)\cos\left(6t^{-1} + t^2\right)dt$

8. $\int \left(7y - 2y^3\right)e^{y^4 - 7y^2}\,dy$

9. $\int \dfrac{4w+3}{4w^2 + 6w - 1}\,dw$

10. $\int \left(\cos(3t) - t^2\right)\left(\sin(3t) - t^3\right)^5 dt$

11. $\int 4\left(\dfrac{1}{z} - e^{-z}\right)\cos\left(e^{-z} + \ln z\right)dz$

12. $\int \sec^2(v)\,e^{1+\tan(v)}\,dv$

13. $\int 10\sin(2x)\cos(2x)\sqrt{\cos^2(2x) - 5}\,dx$

14. $\int \dfrac{\csc(x)\cot(x)}{2 - \csc(x)}\,dx$

15. $\int \dfrac{6}{7 + y^2}\,dy$

16. $\int \dfrac{1}{\sqrt{4 - 9w^2}}\,dw$

17. Evaluate each of the following integrals.

   (a) $\int \dfrac{3x}{1 + 9x^2}\,dx$

   (b) $\int \dfrac{3x}{\left(1 + 9x^2\right)^4}\,dx$

   (c) $\int \dfrac{3}{1 + 9x^2}\,dx$

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