MAT 115 Worksheet 10
Thursday, Nov 2 2017

Important info: Welcome to the MAT 115 workshop! My name is **Diego Avalos** (avalosgalvez@cpp.edu), and I will be your workshop facilitator. We meet on Tuesdays and Thursdays from 4 to 5:50 pm in room 4-1-314. My office hour is on Mondays from 11:30 am to 12:30 pm in room 94-219. All worksheets and solutions may be found at the website **www.diegoavalos.net/teaching/mat115workshop2017**.

Use integration by parts to solve the following integrals.

1. $\int xe^{3x}\,dx$
2. $\int x\sec x\tan x\,dx$
3. $\int \ln 5x\,dx$
4. $\int \frac{\ln^2 x}{x}\,dx$
5. $\int x\tan^{-1} x\,dx$
6. $\int \frac{xe^x}{(x+1)^2}\,dx$
7. $\int \frac{x^3}{\sqrt{1-x^2}}\,dx$
8. $\int \frac{\cot^{-1}\sqrt{x}}{\sqrt{x}}\,dx$
9. $\int \cos\sqrt{x}\,dx$
10. $\int_0^{\pi/3} \sin 3x\cos x\,dx$
11. $\int_1^4 \sqrt{x}\ln x\,dx$
12. $\int_{\pi/6}^{\pi/3} e^{4x}\sin 3x\,dx$

Evaluate the following integrals using trigonometric substitution.

13. $\int \sqrt{4-x^2}\,dx$
14. $\int \frac{x^2}{\sqrt{16-x^2}}\,dx$
15. $\int \frac{1}{(4+x^2)^2}\,dx$

16. The region bounded by the curves $y = \sec x$ and $y = 2$, for $0 \le x \le \pi/3$, is revolved around the x-axis. What is the volume of the solid generated?

17. The region bounded by the graphs of $y = (x-2)^2$ and $y = 4$ is revolved about the line $y = 4$. What is the volume of the resulting solid?

18. The region bounded by the graphs of $y = 2x$, $y = 6 - x$, and $y = 0$ is revolved about the line $y = -2$ and the line $x = -2$. Find the volumes of the resulting solids. Which one is greater?