MAT 115 Worksheet 12
Thursday, Nov 9 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**.

Evaluate the following integrals using trigonometric substitution.

1. $\int \sqrt{4 - x^2}\, dx$

2. $\int \dfrac{x^2}{\sqrt{16 - x^2}}\, dx$

3. $\int \dfrac{1}{(4 + x^2)^2}\, dx$

4. $\int \dfrac{\sqrt{x^2 - 9}}{x}\, dx$

5. $\int \dfrac{3x^3}{\sqrt{1 - x^2}}\, dx$

6. $\int \dfrac{1}{x^2\sqrt{9x^2 - 4}}\, dx$

7. $\int \dfrac{1}{(1 - x^2)^{3/2}}\, dx$

8. $\int \dfrac{1}{\sqrt{x^2 - 9}}\, dx$

9. $\int \dfrac{1}{(4x^2 - 9)^{3/2}}\, dx$

10. Complete the square and use a trigonometric substitution to evaluate the integral

$$\int_1^2 \frac{1}{\sqrt{4x - x^2}}\, dx$$

11. Find the exact arclength of the curve over the interval

   (a) $y = 3x^{3/2} - 1$ from $x = 0$ to $x = 1$

   (b) $y = x^{2/3}$ from $x = 1$ to $x = 8$

   (c) $24xy = y^4 + 48$ from $y = 2$ to $y = 4$

12. Find the area of the surface generated by revolving the given curves about the x-axis.

   (a) $y = 7x, 0 \le x \le 1$

   (b) $y = \sqrt{4 - x^2}, -1 \le x \le 1$