MATH 1700 D01 Summer 2015 Assignment 3

SHOW ALL WORK to get full marks. Leave answers as exact answers. For example, leave it as e^2 as opposed to a decimal approximation. Simplify as much as possible. You may not use any integration formula found online or in the text. All work must be shown. (You may use trig identities)

Find the following definite or indefinite integrals

1. $\displaystyle\int_0^{\pi/2} \sin^2\theta \cos^2\theta \, d\theta$

2. $\displaystyle\int \frac{\sin^4\theta}{\cos^8\theta} \, d\theta$

3. $\displaystyle\int_1^4 \sqrt{x}\ln x \, dx$

4. $\displaystyle\int x \sin\sqrt{x}dx$

5. $\displaystyle\int \frac{-t^2 - 16t + 8}{t^4 + 4t^2} \, dt$

6. $\displaystyle\int e^{2x}\sin 3x dx$

7. $\displaystyle\int \frac{y^2}{(4-y^2)^{3/2}} \, dy$

8. $\displaystyle\int t(1 - 2\sin^2 t)dt$

9. $\displaystyle\int_{-1}^1 \frac{3x^3 - 8x^2 - 15x - 2}{x - 4} dx$

10. Find the area of the region bounded by the hyperbola $y^2 - x^2 = 9$ and the line $y = 5$.