Math 2413 – Calculus I
Instructor: Khoury

Homework (sec 4.6)

Find each *indefinite* integral

1. $\int \sin^3 x \cos x \, dx$

2. $\int \frac{2x^2}{\sqrt{1-4x^3}} dx$

3. $\int x^9 \sin x^{10} \, dx$

4. $\int_{-1}^{2} x^2 e^{x^3+1} dx$

5. $\int_{0}^{4} \frac{x}{x^2+1} dx$

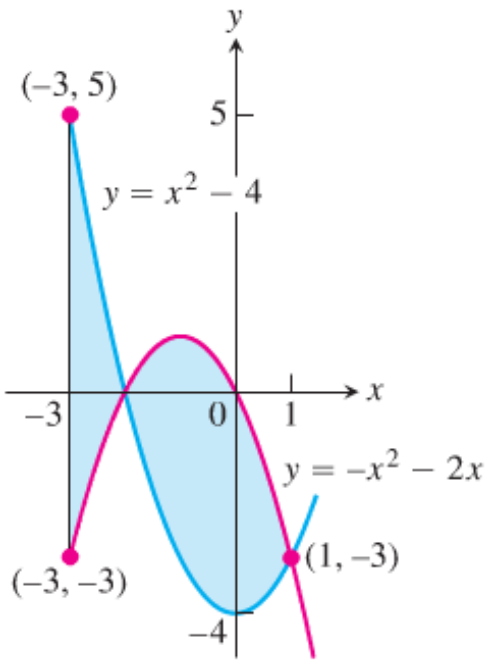
6. $\int_{1}^{e^2} \frac{\ln x}{x} dx$

7. $\int_{0}^{3} \frac{x^2+1}{\sqrt{x^3+3x+4}} dx$

8. $\int_{-\pi/4}^{\pi/4} \sin^2 2\theta \, d\theta$

9. $\int_{0}^{1} \left(y^3+6y^2-12y+9\right)^{-1/2} \left(y^2+4y-4\right) dy$

10. Find the total ***areas*** of the shaded regions



11. Find the ***area*** of the region bounded by the graphs of $x = y^2 - y$ and $x = 2y^2 - 2y - 6$

12. Find the area of the region bounded by the graph of $f(x) = x \sin x^2$ and the *x-axis* between $x = 0$ and $x = \sqrt{\pi}$.