Math 222
Spring 2017
Quiz 9

Name (Print): _____

---

1. (45 points) Find the integral...

   (a) (15 points) $\int (4 - x^2)^{3/2}\, dx$ (Hint: Trig Substitution.)

   (b) (15 points) $\int \dfrac{23 - 2x}{x^2 - 3x - 4}\, dx$ (Hint: Partial Fractions.)

   (c) (15 points) $\int \tan^3\theta\, d\theta$ (Hint: Use $\tan^2\theta = 1 + \sec^2\theta$ and break this into two integrals.)

2. (55 points) Suppose we want to find the integral

$$\int \sec^{-1} x \, dx$$

(a) (10 points) Find $\int \sec\theta \, d\theta$ by using the identity $\sec\theta = \dfrac{\sec^2\theta + \sec\theta\tan\theta}{\sec\theta + \tan\theta}$ and u-substituion with $u = \sec\theta + \tan\theta$.

(b) (15 points) Use trig substitution on $\int \dfrac{1}{\sqrt{x^2-1}} \, dx$ get the integral from part (a).

(c) (15 points) Use integration by parts on $\int \sec^{-1} x \, dx$ to get the integral from part(b)

(d) (15 points) Put this all together to find the final integral.