

# Math 212 1XW Quiz 1

June 8, 2020

Name: \_\_\_\_\_

Instructions: Use your own scrap paper and write your answers in the space provided.

1. Complete the following rules:

(a)  $\int \ln x \, dx =$  \_\_\_\_\_ (b)  $\int \frac{1}{1-x^2} \, dx =$  \_\_\_\_\_

(c)  $\int \frac{1}{x} \, dx =$  \_\_\_\_\_ (d)  $\int \cosh x \, dx =$  \_\_\_\_\_

(e)  $\int \sec x \, dx =$  \_\_\_\_\_ (f)  $\int \sec^3 x \, dx =$  \_\_\_\_\_

(g)  $\int \frac{1}{1+x^2} \, dx =$  \_\_\_\_\_ (h)  $\cosh^2 x \, \text{_____} = 1$

2. State the Integration by Parts Formula: \_\_\_\_\_

3. What mnemonic tells you how to choose  $u$  in the above formula? \_\_\_\_\_

4. Integrate the following:

(a)  $\int_0^{\sqrt{\pi}} x^3 \sin x^2 \, dx =$  \_\_\_\_\_ (b)  $\int \frac{x^3}{\sqrt{4-x^2}} \, dx =$  \_\_\_\_\_

(c)  $\int \sin^5 x \cos^3 x \, dx =$  \_\_\_\_\_ (d)  $\int \sec^2 \theta \ln \tan \theta \, d\theta =$  \_\_\_\_\_

## Bonus:

1. What would be an appropriate (trig) substitution to compute the following?

$$\int \frac{x^2}{\sqrt{x^2+9}} \, dx: \text{_____}$$

2. Write down the partial fractions decomposition of  $\frac{12}{x^3(x^2+4)^2(x^2-1)}$ . You may use  $A, B, C, \dots$  for the arbitrary constants. You need not find the values of the arbitrary constants.

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