Instructions: This is your first quiz. The problems are drawn from the problems worked in lecture and in sections. The problems are all multiple choice. If multiple answers seem plausible please choose the **best** possible answer: multiple answers will be scored as incorrect.

1: What substitution would you make to simplify the following integral

$$\int \frac{x^2}{1 + x^3} dx$$

- **a:** $u = 1 - x$

- **b:** $u = 1 + x^2$

- **c:** $u = x^3$

- **d:** $u = \frac{1}{1+x^3}$

- **e:** $u = x^2$

2: Evaluate the integral

$$\int \frac{x^2}{1 + x^3} dx$$

- **a:** $\frac{1}{3} \ln |1| + 3 \ln |x^3| + C$

- **b:** $\frac{1}{3} \ln |1 + x^3| + C$

- **c:** $\frac{\ln |1+x^3|}{3x^2} + C$

- **d:** $\arctan(x^{\frac{3}{2}}) + C$

- **e:** $3 \ln |1 + x^3| + C$

3: What substitution would you make in the integral

$$\int \frac{dx}{x \ln |x|}$$

- **a:** $u = \frac{1}{x}$

- **b:** $u = \ln |x|$

- **c:** $u = \frac{1}{x \ln |x|}$

- **d:** $u = e^x$

- **e:** $u = x \ln |x|$

4: Evaluate the integral

$$\int \frac{dx}{x \ln |x|}$$

- **a:** $\ln |\ln |x|| + C$

- **b:** $\frac{\ln |x|}{x} + C$

- **c:** $x \ln |x| + C$

- **d:** $\frac{-1}{x^2 \ln |x|} - \frac{1}{x^2 \ln^2 |x|} + C$

- **e:** $\ln |x| + C$

5: Compute the derivative

$$\frac{d}{dx} \tan(2x) = \frac{d}{dx} \frac{\sin(2x)}{\cos(2x)}$$

- **a:** $2 \sec(2x) \tan(2x)$

- **b:** $-\frac{1}{2} \ln |\cos(2x)|$

- **c:** $\frac{1}{2} \sec^2(2x)$

- **d:** $2 \sec^2(2x)$

- **e:** $-\frac{1}{2} \sec(2x) \tan(2x)$

6: What is the correct statement of the chain rule for derivatives

$$\frac{d}{dx} f(g(x)) =$$

- **a:** $g'(x) f'(g(x))$

- **b:** $f'(x) f(g(x))$

- **c:** $f'(g(x))$

- **d:** $f'(x) f(g'(x))$

- **e:** $f'(x) g(x) + f(x) g'(x)$