

# MTH 2201 Test #4

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Name \_\_\_\_\_

**Instructions:** Show CLEARLY how you arrive at your answers.

1. Given that  $\ln(2) \approx 0.7$  and  $\ln(6) \approx 1.8$ , Approximate the following, without the use of a calculator:

(a)  $\ln(12) =$

(b)  $\ln(3) =$

(c)  $\ln(8) =$

2. Compute:  $\frac{d}{dx} [\ln(3x^2 + 4x)] =$

3. Compute:  $\frac{d}{dx} \left[ \ln \left( \frac{2x^3 + 8x}{4x^3 + 4} \right) \right] =$

4. Compute:  $\frac{d}{dx} [e^{4x^3}] =$

5. Compute:  $\int (6x^2 + 6x + 4) dx =$

6. Compute:  $\int \frac{5}{x} dx =$

7. Compute:  $\int e^{7x} dx =$

8. Compute the area bounded by the graph of  $f(x) = x^2 + 1$  and the  $x$ -axis between  $x = -1$  and  $x = 1$

9. Compute:  $\int_{x=-1}^{x=2} (3x^2 - 4x + 4) dx =$

10. Given the demand function  $q = D(x) = \frac{100}{(x+3)^2}$  and the current price of  $x = 1$  :

(a) Compute the elasticity function,  $E(x)$

(b) Compute the value of the elasticity function at the current price

(c) Interpret the result

(d) Determine the price  $x$  at which the revenue is maximized