

# Math 2143 - Brief Calculus with Applications

Exam #3 - 2014.11.30

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

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1. Compute the following integral:

$$\int x \sqrt{x^2 + 3} dx$$

2. Compute the following derivative:

$$\frac{d}{dx} e^{\sqrt{x^2-3}}$$

3. Compute the following integral:

$$\int \frac{(\ln(x))^3}{x} dx$$

4. Compute the following derivative:

$$\frac{d}{dx} \ln \left( (5x + 3) \cdot \sqrt{4x - 5} \cdot \frac{7}{x^2 + 1} \right)$$

5. Compute the following integral:

$$\int \frac{x}{\sqrt{x^2-3}} e^{\sqrt{x^2-3}} dx$$

6. Find the area between the curve  $y = \sqrt{x}$  and the  $x$ -axis for  $0 \leq x \leq 1$ .

7. Find the area between the curve  $y = \sqrt{x}$  and  $y = x$  using your answer to problem 6 and WITHOUT doing any further integrations. (Hint: You can geometrically find the area under  $y = x$  for  $0 \leq x \leq 1$ .)