

Name \_\_\_\_\_

**RULES FOR PART 1 OF THIS TEST:**

- No calculators allowed!
- You do not need to simplify your answers.
- Show all of your work for each problem.

1. (24 points) Complete each boxed equation with the appropriate formula for the derivative.

(a) If  $y = e^{(2x-3)}$ , then

$D_x y =$
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(b) If  $y = x^3 \ln(x)$ , then

$\frac{dy}{dx} =$
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(c) If  $g(x) = x^4 e^{-x}$ , then

$$g'(x) =$$

(d) If  $f(x) = \ln(\sqrt{4x-6})$ , then

$$f'(x) =$$

2. (24 points) Complete each boxed equation with the value of the given integral.

(a)  $\int_0^1 6e^{2x} dx =$

(b)  $\int \frac{6 \ln x}{x} dx =$

(c)  $\int \frac{12x}{2x^2 + 3} dx =$

3. (12 points) Solve for  $x$  in the following equations.

(a)  $e^{2x} = 4$

(b)  $4^{x-1} = 8$