Calculus II	**Name:** _____
Study Guide 4	**Class:** _____
Due Date: _____	**Score:** _____

No Work $\Leftrightarrow$ No Points

Use Pencil Only $\Leftrightarrow$ Be Neat & Organized

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1. (3 points) Write as a single log: $3\log_5 2 + 5\log_5 x - \frac{1}{5}\log_5 y$

1. _____

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2. (3 points) Write as a single log: $2 - 3\log_2 x - \frac{3}{4}\log_2 y$

2. _____

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3. (3 points) Expand and simplify: $\log_3 81x^2$

3. _____

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4. (4 points) Expand and simplify: $\log_2 \dfrac{32\sqrt{x}}{y^3}$

4. _____

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5. (4 points) Write as a single log: $3\log_2 x - \dfrac{1}{4}\log_2 y - 2$

5. _____

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6. (3 points) Find the inverse of $f(x) = \log_3(x+5)$**.**

6. _____

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7. (3 points) Find the inverse of $f(x) = \ln(2x-1)$**.**

7. _____

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8. Find $f'(x)$ for

(a) (3 points) $f(x) = \ln e^x$

(a) _____

(b) (3 points) $f(x) = e^{\ln x}$

(b) _____

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9. Evaluate the following integrals.

(a) (4 points) $\displaystyle\int \frac{\sec^2 x}{1+\tan x}\,dx,\ 0 < x < \pi/2$

(a) _____

(b) (4 points) $\displaystyle\int \frac{\sin x}{4-\cos x}\,dx$

(b) _____

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10. (3 points) Find the equation of the tangent line to the graph of $f(x) = x \ln x$ at $x = e$.

10. _____

11. (4 points) Find the area of the region bounded by $f(x) = \dfrac{\ln x}{x}$, $x = 1$, $x = e$, and $y = 0$. Drawing required.

11. _____

12. (3 points) Find $\dfrac{dy}{dx}$ if $e^{\sin y} + xy = \ln y$.

12. _____

13. (3 points) Evaluate $\displaystyle\int \frac{1}{x \ln x}\, dx$.

13. _____