

Test Total

Name _____

Honor's Calculus II Exam 1 Dr. Clemons

INSTRUCTIONS: Show your work!

Exam 1A

1. Evaluate and simplify the derivatives of the following functions of x :

(a) $f(x) = 5^x x^5$.

7 pts

(b) $g(x) = \frac{e^{3x^2-1}}{(e^x)^2}$.

7 pts

(c) $h(x) = \sec^{-1}(\sqrt{x})$.

7 pts

(d) $j(x) = e^{-5x} \cosh(2x)$.

7 pts

(d) $k(x) = \log_2(\sqrt{x^2 - 4})$.

7 pts

Pg 1 Tot: 35

2. Evaluate and simplify the following integrals:

(a) $\int \frac{dx}{x\sqrt{4 - (\ln x)^2}}$

8 pts

(b) $\int_0^{1/2} \frac{e^{2x}}{\sqrt{4 - e^{2x}}} dx.$

8 pts

(c) $\int \frac{t+1}{t^2+4} dt.$

8 pts

(d) $\int e^{2x} \tan(1 + e^{2x}) dt.$

(e) $\int \frac{\ln x}{x^2} dx$

(f) $\int \sqrt{\cos x} \sin^3 x dx$

(g) $\int x^7 e^{-x^4} dx$

8 pts

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3. Use L'Hospital's Rule to evaluate:

(a) $\lim_{x \rightarrow 0^+} x^{\sin x} = .$

7 pts

(b) $\lim_{x \rightarrow \infty} x \ln \left(\frac{x+1}{x-1} \right) = .$

7 pts

Pg 3 Tot: 14

Name _____

4. Consider the function $f(x) = 4x + \cos(2x)$.

(a) Show that $f(x)$ has an inverse function on its whole domain.

4 pts

(b) Find the slope of the tangent line to $y = f^{-1}(x)$ at the point $(5\pi, \frac{5\pi}{4})$.

6 pts

5. Use logarithmic differentiation to find the derivative of

$$f(x) = (2x - 5)^3 \sqrt[5]{\frac{x-1}{x+1}}$$

9 pts

Pg 4 Tot: 19