

Name: _____

1. Evaluate the integrals EXACTLY. Show your substitutions.

(a) $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

10 pts

(b) $\int (\tan x) \ln(\cos x) dx$

10 pts

(c) $\int \frac{dt}{\sqrt{16t^2 + 1}}$

10 pts

(OVER)

2. Let $f(x) = \ln(\ln x)$.

10 pts

(a) Find the domain of $f(x)$.

(b) Differentiate $f(x)$.

3. Find the EXACT equation of the tangent line to the curve given by $y = 3 \arccos(x/2)$ at the point $(1, \pi)$. (Do not use decimal approximations.) Recall you can draw a graph on your GC to see if your answer looks correct.

10 pts

4. Evaluate $\int \frac{x+9}{x^2+9} dx$.

10 pts

5. USE THE DEFINITION of $\cosh(x)$ to derive a formula for $\frac{d}{dx} \cosh(x)$. (Write the derivative in terms of another hyperbolic function.)

10 pts

(OVER)

6. Calculate the limits using exact methods. Do not use decimal approximations in your answer.

(a) $\lim_{x \rightarrow 2^-} e^{\frac{3}{x-2}}$

10 pts

(b) $\lim_{x \rightarrow \infty} \left(1 + \frac{5}{x}\right)^x$

10 pts

(c) $\lim_{t \rightarrow 0} \frac{5^t - 3^t}{t}$

10 pts