AP Calculus
3.9 Worksheet

*All work must be shown in this course for full credit. Unsupported answers may receive NO credit.*

1. Suppose $10 = e^{xy} + x^2 + y^2$, find $\frac{dy}{dx}$.

2. Find $g'(t)$ if $g(t) = t^e\left(e^{-t}\right)$

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3. Find $g'(t)$ if $g(t) = \ln(\ln t)$.

4. Use properties of logarithms to rewrite *h* (*x*) and then find $h'(x)$ if $h(x) = \ln\left(\frac{1+e^x}{1-e^x}\right)$.

5. Find the first derivative for $y = x^{\ln x}$ (use logarithmic differentiation).

6. Find $y'$ if $y = \dfrac{x^3}{3^x}$ first using the quotient rule, then using logarithmic differentiation.

7. Solve the following without using a calculator: If $f(x) = \left(x^2 + 1\right)^{(2-3x)}$, then $f'(1) =$

A $-\frac{1}{2}\ln(8e)$ B $-\ln(8e)$ C $-\frac{3}{2}\ln(2)$ D $-\frac{1}{2}$ E $\frac{1}{8}$

8. If $y = \tan u$, $u = v - \dfrac{1}{v}$, and $v = \ln x$, what is the value of $\dfrac{dy}{dx}$ at $x = e$ ?

A 0 B $\frac{1}{e}$ C 1 D $\frac{2}{e}$ E $\sec^2(e)$

9. Complete the following questions from the textbook:
page 178 – 179 #1, 4, 5, 7, 8, 11, 12, 13, 16, 17, 21, 22, 26, 29, 30, 33, 37, 40, 41, 45