

Name: _____ I.D.#: _____ Serial #: _____

Section #

14

20

Answer all the questions

Show all of your work

Question #	1	2	3	4	5	6	7	8
Grade	/5	/5	/5	/5	/5	/5	/5	/5

Total /40

1. Use implicit differentiation to find $\frac{dy}{dx}$ if $3xy = \tan y - 2$

2. $\lim_{x \rightarrow 0} \frac{1 - \tan x}{\csc x}$

3. Find $f'(x)$, if $f(x) = \ln 10^x \cos x$

4. $\lim_{x \rightarrow 0} \frac{1}{x} - \frac{1}{e^x - 1}$

5. Let $f(x) = x^2 e^x$, $x > 0$. f is 1-1 and let $f^{-1}(x) = y$, then find $\frac{dy}{dx}$, and $\frac{d^2 y}{dx^2}$

6. Let $f(x) = e^x \sec^2 x^{\frac{3}{5}}$, find $\frac{df}{dx}$ (do not simplify)

7. Use local linear approximation to estimate $\sin 31$, let $f(x) = \sin x$ and $x = \frac{\pi}{6}$

8. An aircraft is climbing at a 30° angle to the horizontal . How fast is the aircraft gaining altitude if its speed is 500 mi/h ?