中華技術學院暑修習題

科目： 微積分　　班級：日二專

一、填空

1. $f(x)=3x^3+4x-5$, 則 $f'(x)=$ _____

2. $f(x)=\sin(8x^2+4)$, 則 $f'(x)=$ _____

3. $f(x)=\tan^2(5x+6)\neq$, 則 $f'(x)=$ _____

4. $f(x)=(x^3+2x)\,8^x$, 則 $f'(x)=$ _____

5. $f(x)=[\log_3(x^2+2)]^5$, 則 $f'(x)=$ _____

6. $f(x)=7^{\sin x}$, 則 $f'(x)=$ _____

7. $f(x)=\dfrac{\tan^2 x}{5x}$, 則 $f'(x)=$ _____

8. $f(x)=\sec^6(3x+2)$, 則 $f'(x)=$ _____

9. $f(x)=\dfrac{6}{\sqrt{x}}$, 則 $f'(x)=$ _____

10. $f(x)=x^{\cos x}$, 則 $f'(x)=$ _____

二、計算

1. Is the function $f(x)$ defined by

$f(x)=\begin{cases}x^2+4, & for\ x>1\\ 5x-1, & for\ x\le 1\end{cases}$ continuous ? why ?

2. Function $f(x)$ is defined as follow：

$f(x)=\begin{cases}x^2, & if\ x\le 2\\ ax+b, & if\ x>2\end{cases}$,Find value of *a* and *b*, such that $f'(2)$ exists.

3. Show the limit $\lim\limits_{x\to\infty}\dfrac{\sin x}{x}=0$

4. Show the function $f(x)=|x|$ is not differentiable at $x=0$