Feng Chia University 110-1 Class Purdue I Calculus HW ONE (due by 9/29)

Name：_____ SID：_____

1. Find the domain of the function $$f(x)=\frac{\sqrt{16-x^2}}{x^2-2x-3}$$	2. Find the domain of $$f(x)=\frac{x^2+1}{x^2-2x-15}$$
3. Find the value of $\lim_{x\to 0}\frac{\tan 5x}{\sin 3x}$.	4. Find the value of $\lim_{x\to 0}\frac{\sin 7x}{\sin 3x}$.
5. Find the limit $\lim_{x\to 2}\frac{x^2+x-6}{\lvert x-2\rvert}$	6. Find the limit $\lim_{x\to\infty} x\sin(\frac{1}{x})$

7. Evaluate $\lim_{x\to 1}\frac{x^2-1}{x^2+4x-5}$

8. Evaluate $\lim_{x\to 0}\frac{x}{\sqrt{x+4}-2}$

9. Find the limits $\lim_{x\to 2^+} f(x)$, $\lim_{x\to 2^-} f(x)$ and $\lim_{x\to 2} f(x)$ if

$$f(x)=\begin{cases}\dfrac{x^2-2x-8}{x+2}, & ,x\le 2\\ 3x-2 & ,x>2\end{cases}$$

10. Evaluate the limit $\lim_{x\to\infty}\frac{2x^2+7x-6}{5-4x+3x^2}$

11. Find the vertical asymptote(s) of the function $f(x)=\frac{x^2+2x-1}{x^2-25}$.

12. Show that $\lim_{x\to 0}|x|\sin(x)=0$