Feng Chia University 110-1 Class Purdue I Calculus HW TWO (due by 10/19)

Name：_____ SID：_____

1. What value of k makes the function $f(x)=\begin{cases}\dfrac{x^2+x-6}{x^2-9}, & ,x\neq -3\\ k, & ,x=-3\end{cases}$ continuous at $x=-3$.	2. Evaluate the limit $\lim\limits_{x\to-\infty}\frac{2\lvert x^3\rvert+5}{5-3x^3}$
3. Evaluate $\lim\limits_{h\to 0}\frac{\sqrt[3]{27+h}-3}{h}$	4. Evaluate $\lim\limits_{x\to 1}\frac{x^{2023}-1}{x-1}$
5. Find the derivative of $f(x)=5x^3-3x^2+2x-7$	6. Find the equation of tangent line to the graph of $f(x)=x^3-2x+1$ at a=0.

7. Find the horizontal asymptote(s) to $f(x) = \frac{2|x|-3}{x+5}$.

8. Find the horizontal asymptote(s) to $f(x) = \frac{2x+3}{\sqrt{5x^2+7}}$.

9. Find $f'(x), f''(x), \text{and } f'''(x)$ of f(x)

$f(x) = 5x^4 - 4x^3 + 3x^2 - 2x + 7$

10. Prove that $f(x) = x^4 + x - 3$ has a root on the interval $(1, 2)$