Math 119 Name:____________________________

Exam I Instructor:____________________________

February 10, 1997 Section:____________________________

Find the equation of the line parallel to the line $2x+5y=6$ which passes through the point $(-1,1)$. $y=-\frac{2}{5}x+\frac{3}{5}$ $y=\frac{3}{5}x+-\frac{2}{5}$ $y=-x+1$ $y=-\frac{3}{5}x+-\frac{2}{5}$ $y=\frac{2}{5}x+\frac{2}{5}$

Find the domain of the function $y=\sqrt{x^2-3x+2}$. $\{x : x \leq 1 \quad \text{or} \quad x \geq 2\}$ $\{x : x \leq -2 \quad \text{or} \quad x \geq -1\}$ $\{x : 1 \leq x \leq 2\}$ $\{x : -2 < x < -1\}$ $\{x : x < 1 \quad \text{or} \quad x > 2\}$

Which *equation* does **not** determine a *function*? $x^2+y^2=4$ $\frac{x}{y}=2, \quad \text{for} \quad y \neq 0$ $2x+3y=6$ $y=\sqrt{x^3-1}, \quad \text{for} \quad x \geq 0$ $5y=\tan 3x$

On what intervals is the following function f continuous?

$$f(x)=\sqrt{x+2}+\frac{x+1}{x-1}+|x-2|$$

$[-2,1) \quad \text{and} \quad (1,\infty)$ $[-2,\infty)$ $(-2,2)$ $(-2,-1) \quad \text{and} \quad (1,\infty)$ $(-\infty,2]$

If $f(x)=x^2$, which one is the possible function g such that $(f \circ g)(x)=x^2-10x+25$? $g(x)=x-5$ $g(x)=x+5$ $g(x)=x^2+5$ $g(x)=x^2-5$ $g(x)=-x-5$

Which one has the well-defined limit? $\lim_{x\to 1}\frac{x-1}{\sqrt{x}-1}$ $\lim_{x\to 4}\sqrt{x^2-25}$ $\lim_{x\to -1}\sqrt{x+1}$ $\lim_{x\to 0}\frac{1}{x^4}$ All of them are well-defined.

For what value of α is the function

$$f(x)=\begin{cases} \frac{x^3-1}{x-1} & \text{if } x \neq 1; \\ \alpha & \text{if } x=1 \end{cases}$$

continuous at $x=1$? 3 0 1 -1 It cannot be continous for any α.

If the distance of a particle travels is given by $s(t)=t^3+t^2+6$ kilometers after t hours, how fast is it traveling (in km/hr) after 2 hours? 16 5 7 17 18

Let

$$f(x)=\begin{cases} 0 & \text{if } x<0; \\ x & \text{if } 0 \leq x \leq 1; \\ x^3 & \text{if } x>1 \end{cases}$$

Which of the following statements is true about the function f? It is continuous at every x, and it has a derivative for all x except $x=0$ and 1 It is continuous at all x except $x=0$ and 1 It is continuous at every x, and it has a derivative for all x except $x=0$ It is continuous at all x except $x=0$ and 1, and it has a derivative for all x except $x=1$ It is continuous at every x except $x=1$, and it has a derivative for all x except $x=1$

Find $\lim_{x\to 3^-}\frac{|x-3|}{-x+3}$ 1 -1 0 2 It does not exist.

Find the graph of $y=\cos\frac{x}{2}$.

If $\lim_{x\to 1} f(x)g(x)=-1$ and $\lim_{x\to 1}(f(x)+g(x))=0$, find all possible $\lim_{x\to 1} f(x)$. (Assume that $\lim_{x\to 1} f(x)$ and $\lim_{x\to 1} g(x)$ exist.) ± 1 1 -1 0 2

Find the equation of the tangent line to $y=x\sqrt{x}+1$ at $(1,2)$. $y=\frac{3}{2}x+\frac{1}{2}$ $y=-\frac{3}{2}x+\frac{1}{2}$ $y=\frac{2}{3}x$ $y=\frac{2}{3}x+\frac{1}{2}$ $y=-\frac{2}{3}x$

Which statement is false? If f and g are differentiable, then $\frac{d}{dx}[f(x)g(x)]=f'(x)g'(x)$ If f is differentiable at a, then f is continuous at a $\lim_{x\to a}\frac{f(x)-f(a)}{x-a}=\lim_{h\to 0}\frac{f(a+h)-f(a)}{h}$ If p is a polyomial, then $\lim_{x\to b} p(x)=p(b)$ If $f'(a)$ exists, then $\lim_{x\to a} f(x)=f(a)$

(Partial Credit) Let $f(x) = \frac{|x|}{x}$ and $g(x) = x^2$. Find $f \circ g$ and $g \circ f$, and determine the domain of each.

(Partial Credit) Explain why $\lim_{x\to 0} \frac{1}{x^3}$ does not exist.

That's all folks!