MATH 2107-601

Take-Home Quiz 1

Due: Monday, Febuary 5, 2001, 6:00 p.m. (Handed out: 1/29/2001)

NAME (Print):_____ Student I.D.:_____

NAME (Signature):_____

PART A: State whether the following statements are *true* (T) or *false* (F).

1. _____ $\lim_{x\to 0} 2 = 0$.

2. _____ $\lim_{x\to -1} \frac{x^2+x}{x^2-1} = -\frac{1}{2}$.

3. _____ $\lim_{x\to 1} \frac{3x^2-6x+3}{x-1} = 0$.

4. _____ $\lim_{x\to 2ss} \frac{3-\sqrt{x+7}}{2-x} = 1$.

5. _____ $\lim_{x\to a^+} (mx+b) = ma+b$.

6. _____ $\lim_{x\to \infty} \frac{x}{\sqrt{x^2-4}} = 1$.

7. _____ $\lim_{x\to -\infty} \frac{x}{\sqrt{x^2-4}} = 1$.

8. _____ $\lim_{x\to 2^+} \sqrt{x-2} = 0$.

9. _____ $\lim_{x\to 2} \sqrt{x-2} = 0$.

10. _____ $\lim_{x\to 2^-} \sqrt{x-2}$ does *not* exist.

11. _____ $\lim_{x\to \infty} \frac{x^3}{x^2+1} = \infty$.

12. _____ To *prove* that $\lim_{x\to 2}(3x-2)=4$, we must show that , for *some* neighborhood $N=(4-\epsilon,4+\epsilon)$ of 4, there is a deleted neighborhood $D=(2-\delta,2)\cup(2,2+\delta)$ of 2 such that for all x in D, $3x-2$ is in N.

13. _____ To *prove* that $\lim_{x\to 2}(3x-2)=4$, we must show that , for *any given* neighborhood $N=(4-\epsilon,4+\epsilon)$ of 4, there is a deleted neighborhood $D=(2-\delta,2)\cup(2,2+\delta)$ of 2 such that for all x in D, $3x-2$ is in N .

14. _____The function $f(x)=\frac{2}{x-3}$ can be made *continuous* at $x=3$.

15. _____The function $f(x)=\frac{2x^2-12x+18}{x-3}$ can be made *continuous* at $x=3$.

PART B: *Circle* the *one* correct choice.

1. $\lim_{x\to 3^+}\frac{|x-3|}{x-3}$ is
   a) 3
   b) 1
   c) 0
   d) -1
   e) none of the above

2. $\lim_{x\to 3^-}\frac{|x-3|}{x-3}$ is
   a) 3
   b) 1
   c) 0
   d) -1
   e) none of the above

3. $\lim_{x\to 3}\frac{|x-3|}{x-3}$ is
   a) 3
   b) 1
   c) 0
   d) -1
   e) none of the above

4. $\lim_{x\to +\infty}\frac{|x-3|}{x-3}$ is
   a) $+\infty$
   b) 1
   c) 0
   d) -1
   e) none of the above

5 . $\lim_{x\to-\infty} \frac{|x-3|}{x-3}$ is

a) 1

b) 0

c) -1

d) $-\infty$

e) none of the above

6. $\lim_{x\to-2} \frac{x^2-x-6}{x^2+3x+2}$

a) does not exist

b) is 5

c) is 1

d) is 0

e) is -5

7. $\lim_{x\to a} \frac{x^2-a}{x-a^2}$, for $a \neq 0$ or $a \neq 1$,

a) does not exist

b) is 0

c) is 1

d) is -1

e) is 2

8. $\lim_{x\to a} a$ is

a) a^2

b) a

c) 0

d) 1

e) none of the above

9. If $f(x) = |x-3|$, then $\lim_{x\to3+} \frac{f(x)-f(3)}{x-3}$ is

a) 1

b) 0

c) -1

d) 3

e) none of the above

10. If $f(x) = |x-3|$, then $\lim_{h\to0^-} \frac{f(3+h)-f(3)}{h}$ is

a) 1

b) 0

c) -1

d) 3

e) none of the above