MA 125 Test 1a

NAME : _____

STUDENT NO. _____

1. Evaluate each limit, provide a detailed calculation to get full credit. Write you final answer in the box.

(1)

$$\lim_{x\to 4} \frac{x^2 - x - 12}{x - 4}$$

(2).

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

(3).

$$\lim_{x\to \infty} \frac{5x^2 - 19}{x^2 + 2}$$

(4).

$$\lim_{x\to 2} \frac{-100}{(x-2)^2}$$

(5).

$$\lim_{x\longrightarrow \infty} (\sqrt{9x^2 + x} - 3x)$$

2. If $f(x) = \begin{cases} 8x+1, & x \leq 1 \\ 2x+4, & x > 1 \end{cases}$.

Find $\lim_{x \to 1^-} f(x)$ and $\lim_{x \to 1^+} f(x)$

3. State the domain of the following functions, show your work to get full credit.

1). $f(t) = \ln(t^4 - 81)$

2). $G(x) = sin^{-1}(x^2 - 1)$

4. Show that there is a root of $\cos x = x$ in the specified interval $(0, 1)$.

5.(1) Use the definition of the derivative to obtain $f'(x)$, with $f(x) = \dfrac{5x}{1+x^2}$

(2). Determine the equation of the line tangent to the graph of the function $f(x) = 3x^2 - 6x$ at point $(2, 0)$.

6. Answer the questions on the basis of the graph of f shown in the figure above, write your answer a or b in the corresponding box to get credit.

(1) Is f continuous at 1?

a. Yes; b. No

(2) Is f continuous at 2?

a. Yes; b. No

(3) Is f continuous at 0?

a. Yes; b. No

(4) Does $\lim_{x\to 2} f(x)$ exist?

a. Yes; b. No

(5) Does $\lim_{x\to 1^-} f(x)$ exist?

a. Yes; b. No

(6) Find $\lim_{x\to -\infty} f(x)$

(7) Find $\lim_{x\to 0} f(x)$

7. If a ball is thrown into the air with a velocity of 40 ft/s, its height (in feet) after t seconds is given by $y = 40t - 16t^2$. Find the velocity when $t = 2$.