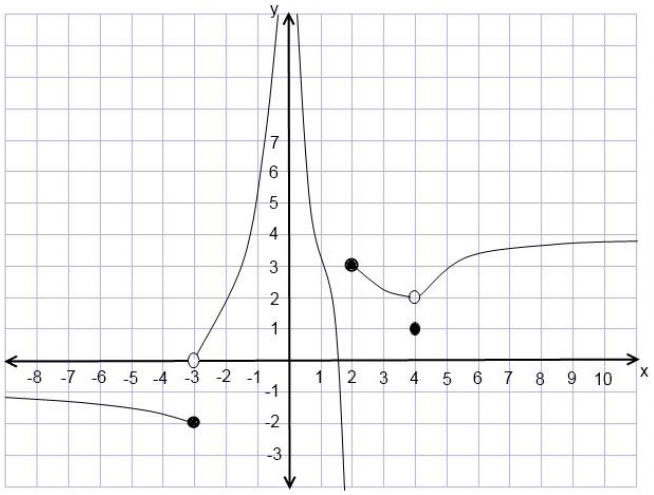
NAME AND ID: _____ $\overline{40}$

MATH 101 QUIZ #1 :

1. The graph of f is given.



(a) $\lim_{x\to 2^+} f(x)$

(b) $\lim_{x\to -3^+} f(x)$

(c) $\lim_{x\to -3} f(x)$

(d) $\lim_{x\to 4} f(x)$

(e) $\lim_{x\to 0} f(x)$

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

(g) State the equations of vertical asymptotes.

2. Evaluate the limit, if it exists:

   (a) $\lim_{x\to 1} \frac{\frac{x}{2}+\frac{2}{x}}{2+x}$

   (b) $\lim_{x\to -3^-} \frac{x^2-9}{[x+3]}$

   (c) $\lim_{x\to 2^-} \frac{2-\sqrt{7x-10}}{x-2}$

   (d) $\lim_{x\to 0}(4+x+x^2\sin(\frac{\pi}{x}))$

(e) $\lim_{x\to 0} \frac{\sin^2 x}{\cos x - 1}$

3. Find the following limits: $\lim_{x\to 3^-} h(x)$ and $\lim_{x\to -3^-} h(x)$, where $h(x) = \begin{cases} x+9 & \text{if } x < -3 \\ -2x & \text{if } |x| \leq 3 \\ -6 & \text{if } x > 3 \end{cases}$

4. Prove that $\lim_{x\to 0}(x^4 \cos \frac{2}{x}) = 0$.

5. Prove the statement using the ε, δ definition of limit. $\lim_{x \to -5}(4 - \frac{3x}{5}) = 7$

6. If $\texttt{lim}_{x \to 1} \frac{f(x)-8}{x-1} = 10$, find $\texttt{lim}_{x \to 1} f(x)$.