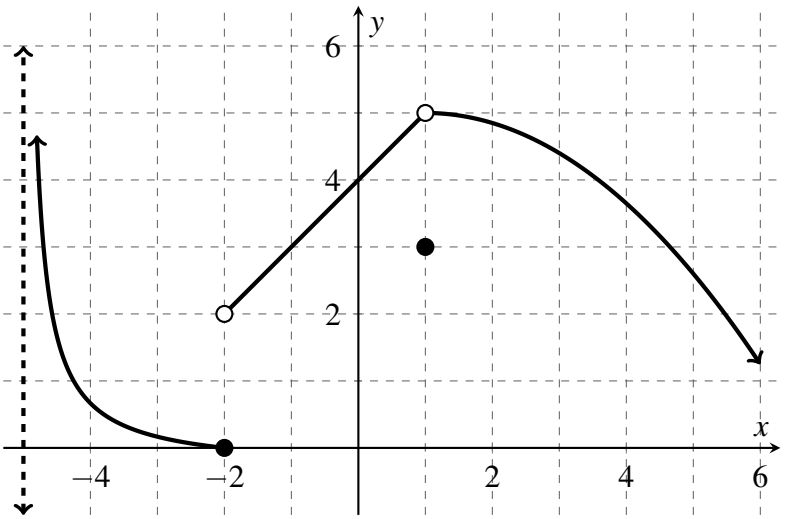
Name: _____ _____ / **25**

There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. (10 points) The function $H(x)$ has domain $(-5,\infty)$ and has a vertical asymptote at $x=-5$. Use the graph of $H(x)$ to answer each question below. If the limit is infinite, indicate that with ∞ or $-\infty$.

$H(x)$



(a) $H(-2) =$ _____ (b) $H(1) =$ _____ (c) $\lim_{x\to -2^+} H(x) =$ _____

(d) $\lim_{x\to -2} H(x) =$ _____ (e) $\lim_{x\to -5^+} H(x) =$ _____ (f) $\lim_{x\to 1} H(x) =$ _____

(g) Estimate $H(4)$.

(h) Evaluate $\lim_{x\to 0}(5H(x)+2)$.

(i) List all x-values in the domain of $H(x)$ for which the function $H(x)$ fails to be continuous.

2. (3 points) If $\lim_{x\to -2} f(x) = 3$ and $\lim_{x\to -2} g(x) = 5$, is it possible to evaluate $\lim_{x\to -2} \dfrac{f(x)+1}{xg(x)}$? If so evaluate the limit. If not, explain why.

3. (8 points) Use algebra to evaluate the limits below. You must show your work to earn full credit **and** your work will be graded. (That is, you need to write your mathematics correctly.)

   (a) $\lim_{x\to\sqrt{7}} \dfrac{x-\sqrt{7}}{x^2-7} =$

   (b) $\lim_{h\to 0} \dfrac{(a+h)^2-a^2}{h} =$

4. (4 points) Let $f(x) = \begin{cases} 2-x^2 & x<0 \\ e^x & x\geq 0 \end{cases}$.

   (a) Find $\lim_{x\to 0^-} f(x)$.

   (b) Find $\lim_{x\to 0^+} f(x)$.

   (c) Use your answers to parts (a) and (b) to justify whether $f(x)$ is or is not continuous at $x=0$. (Your answer should be a complete sentence.)