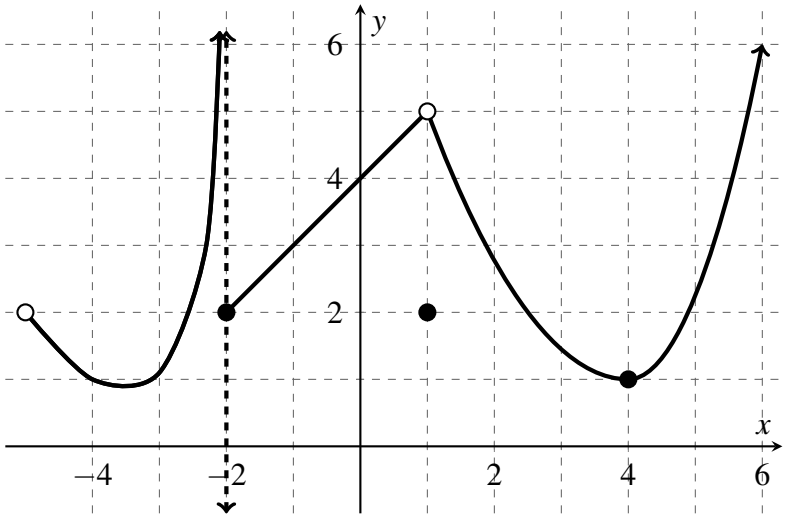
Name: _____ _____ / **25**

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 $x=-2$. Use the graph of $H(x)$ to answer each question below. If the limit is infinite, indicate that with ∞ or $-\infty$. If the value does not exist or is undefined, write **DNE**.

$H(x)$



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

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

(g) Estimate $H(3)$. _____

(h) Evaluate $\lim_{x\to 0}(3H(x)+5)$. _____

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

2. (2 points) If $\lim_{x\to -2} f(x) = 6$ and $\lim_{x\to -2} g(x) = -1$, is it possible to evaluate $\lim_{x\to -2} \dfrac{f(x)+g(x)}{x^2 f(x)}$? If so evaluate the limit. If not, explain why.

3. (9 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) $\lim_{x\to 4} \dfrac{x^2-11x+28}{(x-4)(x+2)} =$

   (b) $\lim_{h\to 0} \dfrac{\frac{3}{(a+h)} - \frac{3}{a}}{h} =$

   (c) $\lim_{x\to 2} \dfrac{(x+2)(x-3)}{x^2+4} =$

4. (4 points) Let $f(x) = \begin{cases} 1-x+x^2 & x \le 0 \\ e^x & x > 0 \end{cases}$.

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

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

   (c) Find $f(0)$.

   (d) Use your answers to the previous parts to explain whether $f(x)$ is or is not continuous at $x = 0$. **Your answer should be a complete sentence.**