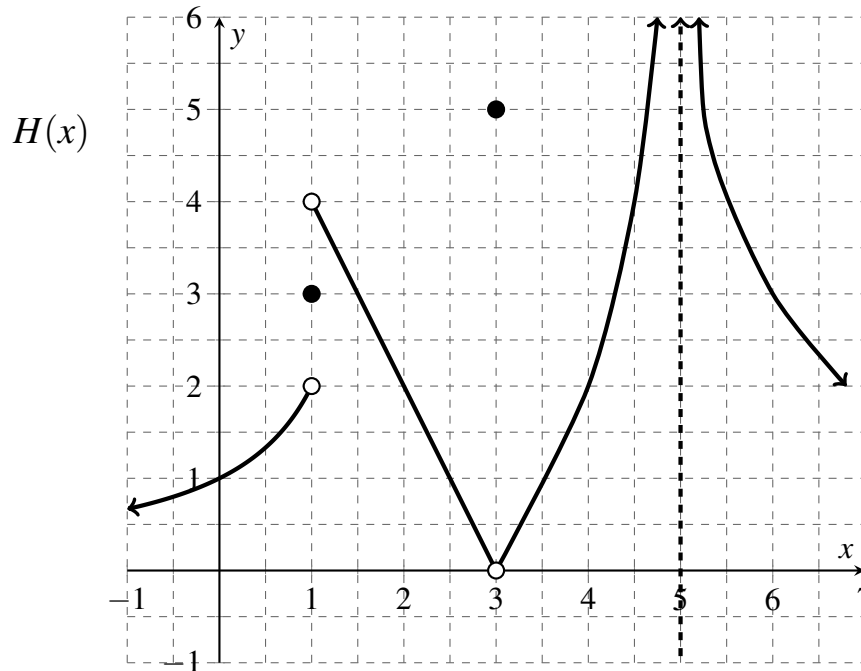


Name: \_\_\_\_\_

\_\_\_\_\_ / 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) Use the graph of the function  $H(x)$  (drawn below) to answer the questions. Assume  $H(x)$  has a vertical asymptote at  $x = 5$ . For each problem below, give the most complete answer; if the limit is infinite, indicate that with  $\infty$  or  $-\infty$ .



- (a)  $H(0) =$  \_\_\_\_\_      (b)  $H(1) =$  \_\_\_\_\_      (c)  $H(3) =$  \_\_\_\_\_
- (d)  $\lim_{x \rightarrow 1^-} H(x) =$  \_\_\_\_\_      (e)  $\lim_{x \rightarrow 1^+} H(x) =$  \_\_\_\_\_      (f)  $\lim_{x \rightarrow 1} H(x) =$  \_\_\_\_\_
- (g)  $\lim_{x \rightarrow 0} H(x) =$  \_\_\_\_\_      (h)  $\lim_{x \rightarrow 3} H(x) =$  \_\_\_\_\_      (i)  $\lim_{x \rightarrow 5} H(x) =$  \_\_\_\_\_
- (j) List all  $x$ -values for which the function  $H(x)$  fails to be continuous.

2. (12 points) Evaluate the following limits. Show your work to earn full credit.

$$(a) \lim_{x \rightarrow -1} \frac{x^2 - 1}{x + 1} =$$

$$(b) \lim_{x \rightarrow 0} \frac{\frac{2}{3+x} - \frac{2}{3}}{x} =$$

$$(c) \lim_{x \rightarrow 5^+} \frac{1 + \sqrt{x+4}}{5-x} =$$

$$(d) \text{ If } \lim_{x \rightarrow 2} f(x) = 7, \text{ find } \lim_{x \rightarrow 2} (5 - 2x + 3f(x)) =$$

3. (3 points) Pick  $k$  such that  $f(x)$  is continuous if  $f(x) = \begin{cases} x^2 & x \leq 2 \\ 3x + k & x > 2 \end{cases}$ .