

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

Date: \_\_\_\_\_

**Learning Goal 2.1**

Finite limits and continuity.

**More Questions**

1. The Heaviside function
- $H$
- is a simple switch equation defined by

$$H(t) = \begin{cases} 0, & t < 0 \\ 1, & t \geq 0 \end{cases}$$

Find the limit as  $t \rightarrow 0$  from both sides.

2. The graph of a function
- $g$
- is shown. Use it to state the following values (if they exist).

a.  $\lim_{x \rightarrow 2^-} g(x)$

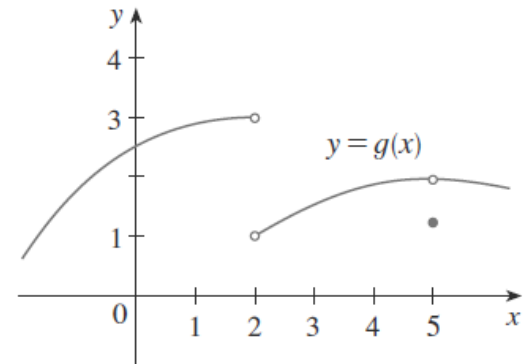
a.  $\lim_{x \rightarrow 5^-} g(x)$

b.  $\lim_{x \rightarrow 2^+} g(x)$

b.  $\lim_{x \rightarrow 5^+} g(x)$

c.  $\lim_{x \rightarrow 2^+} g(x)$

c.  $\lim_{x \rightarrow 5^+} g(x)$



3. Find each limit.

a.  $\lim_{x \rightarrow 0} \frac{1}{x^2}$

b.  $\lim_{x \rightarrow \frac{\pi}{2}} \tan x$

c.  $\lim_{x \rightarrow 0} \ln x$

4. For each function, sketch the graph of the function. Determine the indicated limit, if it exists.

a.  $f(x) = \begin{cases} x + 2, & x < -1 \\ -x + 2, & x \geq -1 \end{cases}$   $\lim_{x \rightarrow -1} f(x)$

b.  $f(x) = \begin{cases} -x + 4, & x \leq 2 \\ -2x + 6, & x > 2 \end{cases}$   $\lim_{x \rightarrow 2} f(x)$

c.  $f(x) = \begin{cases} 4x, & x \geq \frac{1}{2} \\ \frac{1}{x}, & x < \frac{1}{2} \end{cases}$   $\lim_{x \rightarrow \frac{1}{2}} f(x)$

d.  $f(x) = \begin{cases} 1, & x < -0.5 \\ x^2 - 0.25, & x \geq -0.5 \end{cases}$   $\lim_{x \rightarrow -0.5} f(x)$