

# 1.5 Algebraic Properties of Limits

Calculus

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

**Use the table to find the given limits.**

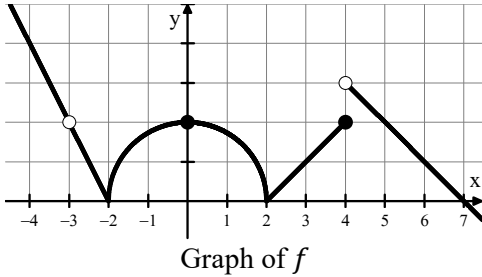
1.

$\lim_{x \rightarrow 4} f(x) = 4$	$\lim_{x \rightarrow 2} f(x) = 6$	$\lim_{x \rightarrow 8} f(x) = 1$	$\lim_{x \rightarrow -4} f(x) = 5$
-----------------------------------	-----------------------------------	-----------------------------------	------------------------------------

- a.  $\lim_{x \rightarrow 4} \left( f(-x) + \frac{f(x)}{2} + f\left(\frac{x}{2}\right) \right)$       b.  $\lim_{x \rightarrow 4} (2f(x)f(2x))$

**Use the graph to find the given limits.**

2.



- a.  $\lim_{x \rightarrow -2} f(f(x)) =$   
 b.  $\lim_{x \rightarrow -4} f(f(x)) =$

**Use the table to find the given limits.**

3.

$f(7) = 3$	$\lim_{x \rightarrow 7} f(x) = -3$
$g(7) = -1$	$\lim_{x \rightarrow 7} g(x) = 1$
$h(7) = 2$	$\lim_{x \rightarrow 7} h(x) = -2$

- a.  $g(7) - \lim_{x \rightarrow 7} \left( \frac{h(x)}{f(x)} \right)$       b.  $\lim_{x \rightarrow 7} (h(x)g(x)) - f(7)$

**Use the piecewise functions to find the given values.**

$$4. g(x) = \begin{cases} \frac{6-x}{2}, & x < -3 \\ x^2 - \frac{12}{x}, & -3 < x < 1 \\ \sqrt{10-x}, & x \geq 1 \end{cases}$$

- a.  $\lim_{x \rightarrow -3^-} g(x)$       b.  $\lim_{x \rightarrow -3^+} g(x)$   
 c.  $\lim_{x \rightarrow -3} g(x)$       d.  $\lim_{x \rightarrow 1} g(x)$

$$5. h(\theta) = \begin{cases} \frac{\sin \theta}{2}, & \theta \leq \frac{\pi}{4} \\ \tan \theta, & \frac{\pi}{4} < \theta \leq \pi \\ \cos \frac{\theta}{4}, & \theta > \pi \end{cases}$$

- a.  $\lim_{\theta \rightarrow \pi^+} h(\theta)$       b.  $\lim_{\theta \rightarrow \frac{\pi}{4}} h(x)$   
 c.  $\lim_{\theta \rightarrow \pi^-} h(\theta)$       d.  $\lim_{\theta \rightarrow \frac{\pi}{4}^+} h(x)$

4b. 13	4c. DNE	4d. DNE	5a. $\frac{2}{\sqrt{2}}$	5b. $\frac{4}{\sqrt{2}}$	5c. 0	5d. 1
1a. 13	1b. 8	2a. 2	2b. DNE	3a. $-\frac{3}{5}$	3b. -5	4a. $-\frac{2}{1}$