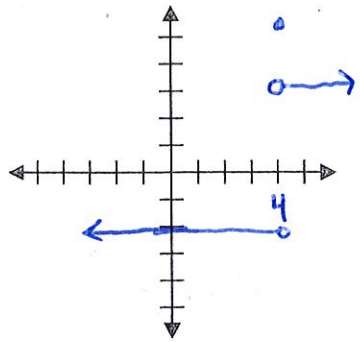
One Sided Limits

Draw a sketch. Find the indicated limit if it exists. If the limit does not exist, explain why.

1. $G(x)=\begin{cases}3, & \text{if } x>4\\ 5, & \text{if } x=4\\ -2, & \text{if } x<4\end{cases}$



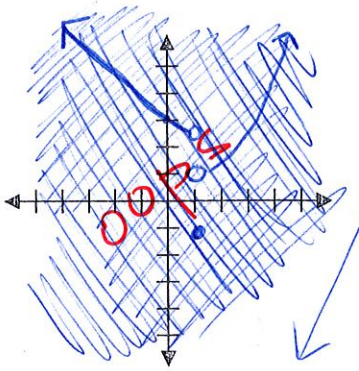
a. $\lim_{x\to 4^+} G(x) = 3$

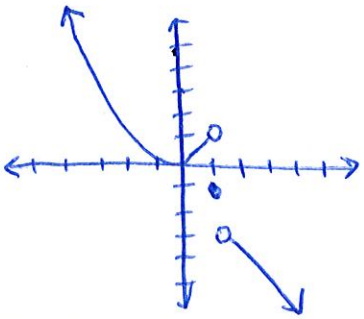
b. $\lim_{x\to 4^-} G(x) = -2$

c. $\lim_{x\to 4} G(x) = \text{DNE}$

d. $G(4) = 5$

2. $T(x)=\begin{cases}3-6x, & \text{if } x>1\\ -1, & \text{if } x=1\\ x^2, & \text{if } x<1\end{cases}$





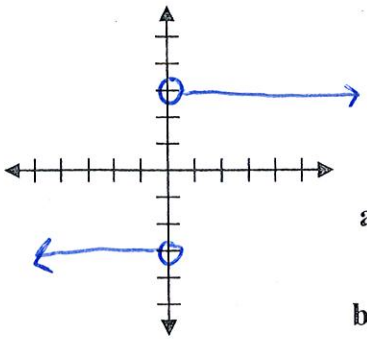
a. $\lim_{x\to 1^-} T(x) = 1$

b. $\lim_{x\to 1^+} T(x) = -3$

c. $\lim_{x\to 1} T(x) = \text{DNE}$

d. $T(1) = -1$

3. $G(x)=\dfrac{|3x|}{x}$



a. $\lim_{x\to 0^+} G(x) = 3$

b. $\lim_{x\to 0^-} G(x) = -3$

c. $\lim_{x\to 0} G(x) = \text{DNE}$

d. $G(0) = \text{DNE}$

4. **Find the limit without sketching the graph**

$$F(x)=\begin{cases}x^2-16, & \text{if } x<3\\ 5, & \text{if } x=3\\ 14-x^2, & \text{if } x>3\end{cases}$$

a. $\lim_{x\to 3^+} F(x) = 5$

b. $\lim_{x\to 3^-} F(x) = -7$

c. $\lim_{x\to 3} F(x) = \text{DNE}$

d. $F(3) = 5$