DEFINITION OF A LIMIT

TEXT: 1.6

LAST NAME	FIRST NAME	DATE

1 (5 points). Use the ϵ, δ definition to show that $\lim_{x \to 3} \frac{5x-1}{2} = 7$

2 (5 points)**.** Use the ϵ, δ definition to show that $\lim_{x \to 4} x^2 = 16$

3 (5 points)**.** Consider the sign function:

$$\text{sign}(x) = \begin{cases} -1 & \text{if } x < 0 \\ 0 & \text{if } x = 0 \\ 1 & \text{if } x > 0 \end{cases}$$

(a) Use the one-sided limits theorem to show that $\lim_{x \to 0} \text{sign}(x)$ does not exist.

(b) Use the precise definition of the limit to show that $\lim_{x \to 0} \text{sign}(x)$ does not exist. Start by choosing an appropriate ϵ.

4 (5 points). Use the ϵ, δ definition to show that $\lim_{x \to 1} \sqrt{10x + 6} = 4$