

1  $f(x) = x$   
 $\lim_{x \rightarrow 3} f(x)$   
 The limit does not exist

2  $f(x) = 5x - 21$   
 $\delta = 0.1$  step of 0.01  
 $x \rightarrow 6$

$\epsilon$	L. H. L $\lim_{x \rightarrow 6^-} f(x)$		R. H. L $\lim_{x \rightarrow 6^+} f(x)$	
	$a - \delta$	lim	$a + \delta$	lim
	5.9	8.5	6.1	9.5
	5.91	8.55	6.09	9.45
	5.92	8.6	6.08	9.4
	5.93	8.65	6.07	9.35
	5.94	8.7	6.06	9.3
	5.95	8.75	6.05	9.25
	5.96	8.8	6.04	9.2
	5.97	8.85	6.03	9.15
	5.98	8.9	6.02	9.1
	5.99	8.95	6.01	9.05
	6.0	9	6.0	9

$$3 \quad \lim_{x \rightarrow 3^+} \frac{3-x}{|3-x|}$$

$$\frac{3-3+h}{|3-3+h|} = \frac{h}{|h|} = \frac{h}{h} = \underline{1}$$

$$4 \quad \lim_{x \rightarrow 3} \frac{x-3}{|x-3|}$$

$$\text{L.H.S} = \lim_{x \rightarrow 3^-} \frac{x-3}{|x-3|} = \frac{3-h-3}{|3-h-3|} = \frac{-h}{|-h|} = \frac{-h}{h} = \underline{-1}$$

$$\text{R.H.S} = \lim_{x \rightarrow 3^+} \frac{x-3}{|x-3|} = \frac{3+h-3}{|3+h-3|} = \frac{h}{|h|} = \frac{h}{h} = \underline{1}$$

$$\text{L.H.S} = -1 \neq \text{R.H.S} = 1$$

∴ Since  $\lim_{x \rightarrow 3^-} \frac{x-3}{|x-3|} \neq \lim_{x \rightarrow 3^+} \frac{x-3}{|x-3|}$  it does not

exist

$x$	$f(x) = \sqrt{x-4}$
4	0
5	1.0
6	1.4
7	1.7
8	2.0

