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Course: Engineering Mathematics

Course code: Eng 281

1) $f(x) = \pi$

Find the $\lim_{x \rightarrow 3} f(x)$

Ans; the lim does not exist

2) $f(x) = 5x - 21$

$\epsilon = 0.1$ and $\text{step} = 0.01$, $a = 6$

L.H.S		R.H.S	
8.9 - 8	$f(x)$	$a + \delta$	$f(x)$
5.9	8.5	6.1	9.5
5.91	8.56	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	8.78	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	9	6.00	9

3) Find $\lim_{x \rightarrow 3} \frac{3 - 5}{|3 - x|}$

R.H.S from $(x \rightarrow 3^+)$

$x = 3 + 0.1$

$= 3.1$

$$\therefore \lim_{x \rightarrow 3^+} \frac{3 - 3.1}{|3 - 3.1|}$$

$$= \frac{-0.1}{| -0.1 |}$$

$$= \frac{-0.1}{0.1}$$

$$= -1$$

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

L.H.S

$$x = 3 - 0.1$$

$$= 2.9$$

R.H.S

$$x = 3 + 0.1$$

$$= 3.1$$

\therefore R.H.S

$$\lim_{x \rightarrow 3^+} \frac{3.1 - 3}{|3.1 - 3|} = \frac{0.1}{0.1} = 1$$

L.H.S

$$\lim_{x \rightarrow 3^-} \frac{2.9 - 3}{|2.9 - 3|} = \frac{-0.1}{|-0.1|} = -1$$

\therefore The limit does not exist since L.H.S \neq R.H.S

$$5) f(x) = \sqrt{x - 4}$$

For continuity $[4, 8] \Rightarrow 4, 5, 6, 7, 8$

1f

$$x = 4$$

$$f(x) = \sqrt{4-4}$$
$$= 0$$

$$x = 5$$

$$f(x) = \sqrt{5-4}$$
$$= 1$$

$$x = 6$$

$$f(x) = \sqrt{6-4}$$
$$= 1.4$$

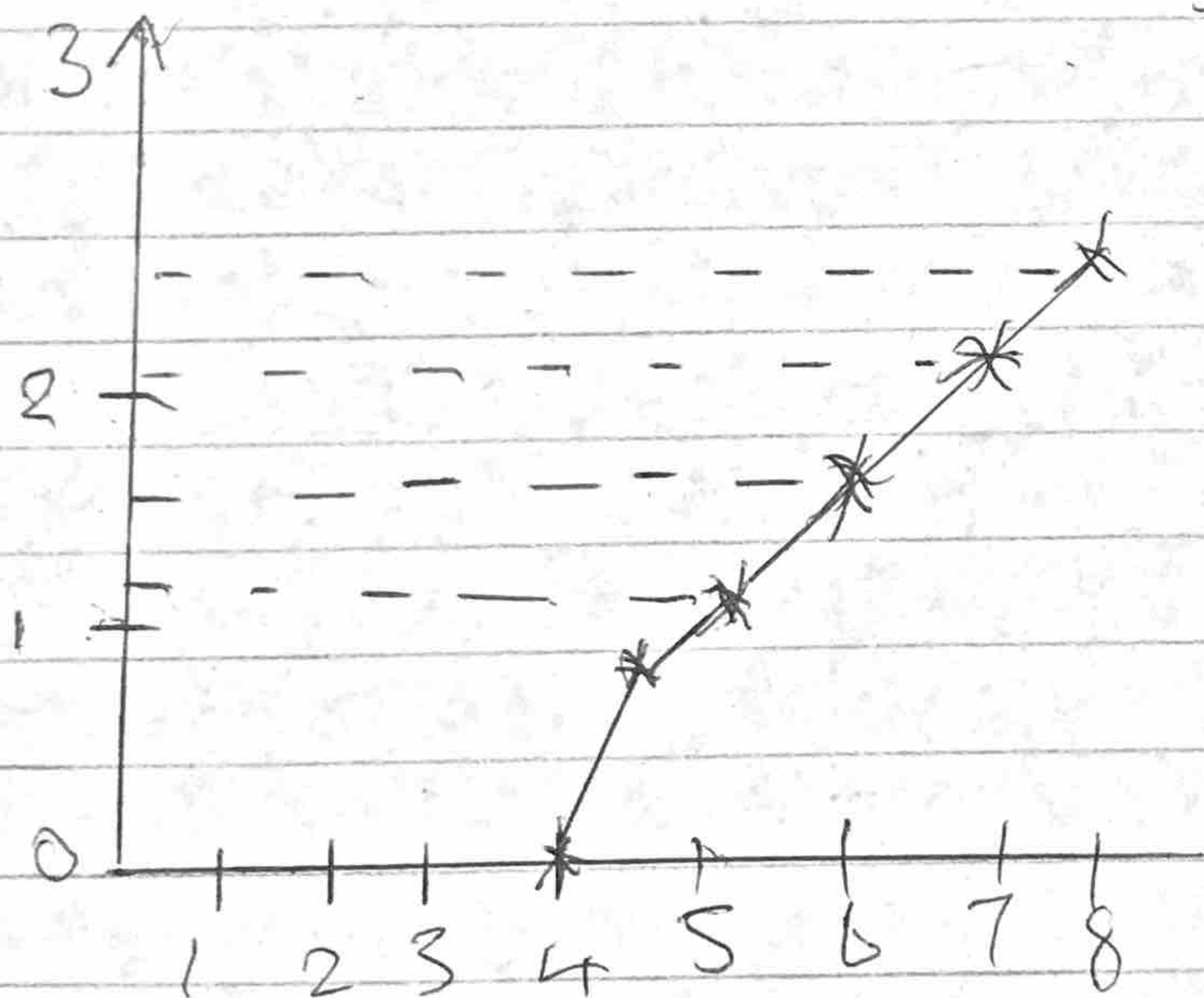
$$x = 7$$

$$f(x) = \sqrt{7-4}$$
$$= 1.7$$

$$x = 8$$

$$f(x) = \sqrt{8-4}$$
$$= 2$$

Continuity graph



Scale: y: 2 cm to 1 unit
x: 1 cm for 1 unit