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① Given a function $f(x)$ $\lim_{x \to 3} f(x)$
Since there is no function to substitute the limit as x, we can say that $f(x) = \pi$

$x = \pi$

$\therefore 3.142.$

② The model of a system has been developed by an engineer to be as given in the equation $f(x)$, $5x - 24$. Given that 8.01, and using a step-20.01 demonstrate, in a tabular form, that the limit of the model as a $x \to 6$ is equal to 9.

$f(x)$	$x-3$	$x=6$	$x+5$	$f(x)$
8.50	5.90		6.10	9.50
8.55	5.91		6.09	9.45
8.60	5.92		6.08	9.40
8.65	5.93		6.07	9.35
8.70	5.94		6.06	9.30
8.75	5.95		6.05	9.25
8.80	5.96		6.04	9.20
8.85	5.97		6.03	9.15
8.90	5.98		6.02	9.10
8.95	5.99		6.01	9.05
9.00	6.00		6.00	9.00

③ Find the limit of the model system question given below

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

$$\lim_{x \to 3^+} \frac{3-x}{|3-x|} = \frac{3-(3+8)}{|3-(3+8)|} = \frac{3-3-8}{|3-3-8|}$$

$$= \frac{-8}{|-8|} = \frac{-8}{8} = -1$$

④ Evaluate the limit of the model given $\lim_{x \to 3} \frac{x-3}{|x-3|}$

$$\lim_{x \to 3} \frac{x-3}{|x-3|} = \frac{(3)-3}{|(3)-3|} = \frac{0}{0}$$ undesined.

Since the $\lim_{x \to 3} \frac{x-3}{|x-3|}$ is undesined, use substitute $(3+8)$ and $(3-8)$ for

$$\lim_{x \to 3^+} \frac{x-3}{|x-3|} = \frac{(3-8)-3}{|(3-8)-3|} = \frac{-8}{8} = -1$$

Therefore, the R.H.S and L.H.S limits do not combine the limit of $\frac{x-3}{|x-3|}$ as the equation to 3 doesn't exist.

⑤ Show that the function given in equation $f(x) = \sqrt{x-4}$ is continuous on the interval $(4, 8)$

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

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

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

x	$f(x) = \sqrt{x-4}$
4	0
5	1.0
6	1.44
7	1.73
8	2