

1) $f(x)$ has a discontinuity @ $x=1, x=2, x=3$

$$\begin{array}{l} \underline{x=1} \\ \bullet f(1) \text{ is undefined} \end{array} \quad \begin{array}{l} \underline{x=2} \\ \bullet f(1) = 2 \neq \lim_{x \rightarrow 2} f(x) = 3 \end{array}$$

$$\begin{array}{l} \underline{x=3} \\ \bullet \lim_{x \rightarrow 3} f(x) \text{ DNE} \end{array}$$

2) $f(x) = x + 5$; $x=1$

I. $f(1) = 6$

II. $\lim_{x \rightarrow 1} f(x) = 6$

III. $f(1) = \lim_{x \rightarrow 1} f(x)$

$f(x)$ is cont. @ $x=1$

3) $f(x) = x^2 + 2x - 1$ $x=0$

I. $f(0) = -1$

II. $\lim_{x \rightarrow 0} f(x) = -1$

III. $f(0) = \lim_{x \rightarrow 0} f(x)$

$f(x)$ is cont. @ $x=0$

4) $f(x) = \frac{x^2 - 16}{x - 4}$; $x=4$

I. $f(4) = \emptyset$

$f(x)$ is not cont. @ $x=4$

5) $f(x) = \frac{x^2 - 25}{x + 5}$ $x=5$

I. $f(5) = 0$

II. $\lim_{x \rightarrow 5} f(x) = 0$

III. $f(5) = \lim_{x \rightarrow 5} f(x)$

$f(x)$ is cont. @ $x=5$.

6) $f(x) = \frac{1}{x}$; $x=3$

I. $f(3) = \frac{1}{3}$

II. $\lim_{x \rightarrow 3} f(x) = \frac{1}{3}$

III. $f(3) = \lim_{x \rightarrow 3} f(x)$

$f(x)$ is cont. @ $x=3$

7) $f(x) = \frac{3x-1}{2x+b}$ $x=-3$

I. $f(-3) = \emptyset$

$f(x)$ is not cont @ $x=-3$

8) $f(x)$ is cont on $[-6, -4) \cup (-4, -2) \cup (-2, -1) \cup (-1, 0]$

9) $f(x)$ is cont on $(-\infty, 0)$

10) $f(x)$ is cont. on $(-\infty, 0) \cup (0, \infty)$

11) $f(x)$ is cont on $(-\infty, 1) \cup (1, \infty)$

12) $f(x)$ is cont. on $(-\infty, 1) \cup (1, 4) \cup (4, 5)$

