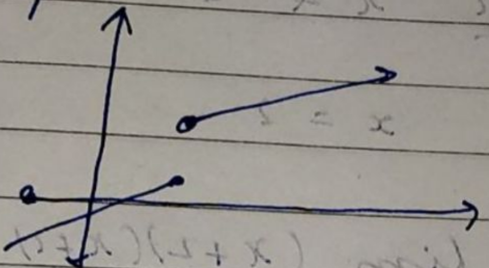
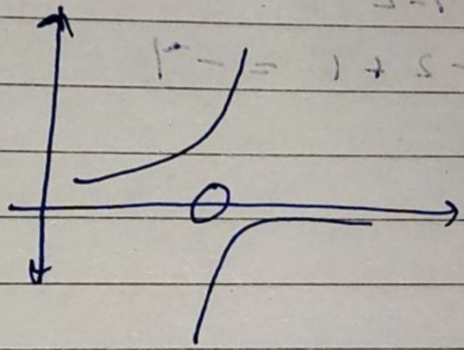
2) Jump



3) Infinite



continuity (on an interval)

$f(x) = \dfrac{x-1}{x^2+2x}$

$x^2 + 2x = 0$

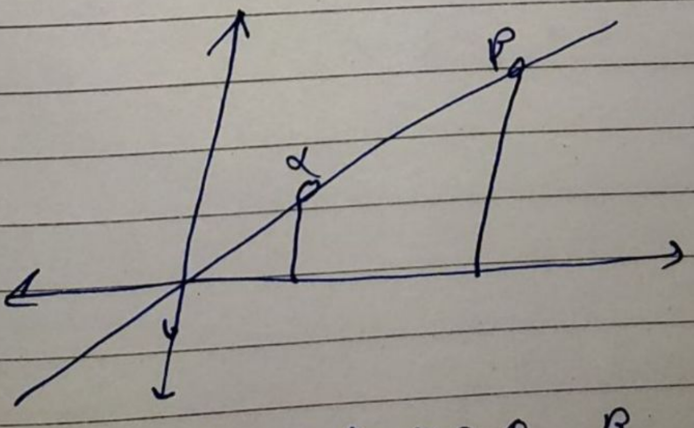
$x(x+2) = 0$

$x = 0, \quad x + 2 = 0$

$x = -2$

$R - \{0, -2\}$

$(-\infty, -2) \cup (-2, 0) \cup (0, \infty)$



except at $x = \alpha, \beta$ $f(x)$ is continu[ous] everywhere

Q $f(x) = \dfrac{x^2 + 3x + 2}{x+2}$ $\quad x \neq -2$

$= k$ $\quad x = 2$

$f(-2) = k$

$\lim\limits_{x \to -2} f(x) = \lim\limits_{x \to -2} \dfrac{(x+2)(x+1)}{(x+2)}$

$= \lim\limits_{x \to -2} (x+1)$

$= -2 + 1 = -1$

$\therefore$ $k = -1$

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131. $f(x) = \dfrac{1}{\sqrt{x}}$

$f(x)$ is discontinue at $x = 0$, ~~removable~~ infinity

132. $f(x) = \dfrac{2}{x^2+1}$

133. $f(x) = \dfrac{x}{x^2 - x} = \dfrac{x}{x(x-1)} = \dfrac{1}{x-1}$

$f(x)$ is discontinue at $x = 1$, ~~jump~~ removable assignment

1. $\lim_{h \to 0} \dfrac{2(-3+h)^2 - 18}{h}$

$\dfrac{2(9 + h^2 - 6h) - 18}{h}$

$\dfrac{18 + 2h^2 - 12h - 18}{h}$

$\dfrac{2h(h-6)}{h}$

$2h - 12$

-12

2. a) $x = 4$ $\quad g(x) = \begin{cases} 2x & x < 6 \\ x-1 & x \geq 6 \end{cases}$

$\lim_{x \to 4^+} x - 1 = 4 - 1 = 3$

$\lim_{x \to 4^-} 2x = 2 \times 4 = 8$ $\qquad$ not cont

b) $x = 6$

$\lim_{x \to 6^+} \cancel{6 \times x} = \cancel{6 \times 1} = \cancel{5}\ 2x = 2 \times 6 = 12$

$\lim_{x \to 6^-} x - 1 = 6 - 1 = 5$

not contineous

3. $\lim_{x \to 9} \frac{x-9}{3-\sqrt{x}}$

$\frac{x-9}{3-\sqrt{x}} \times \frac{3+\sqrt{x}}{3+\sqrt{x}}$

$\frac{(x-9)(3+\sqrt{x})}{9-x}$

$\frac{(x-9)(3+\sqrt{x})}{-(x-9)}$

$-(3+\sqrt{x})$

$-(3+\sqrt{9})$

$-(3+3)$

-9

4. $f(x) = \frac{4x+5}{9-3x}$