Removable + Non Removable Discontinuities

Removable - can eliminate the discontinuity algebraically
  - HOLE (graphically)
  - no values in table (numerically)

Non Removable - can't eliminate the discontinuity algebraically

  - V.A. , JUMPS (graphically)
  - no values in table and
  $$\lim_{x \to c^-} f(x) \neq \lim_{x \to c^+} f(x)$$
  (numerically)

Find discontinuities in the function and identify the type.

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

$= \dfrac{(x+1)(x-1)}{(x+1)(x-2)}$ → nonremovable discont (V.A) @ $x=2$

↳ removable discont (hole) $x = -1$

ex: Find discontinuities
and sketch the graph

$$f(x) = \frac{x}{x^2 - 3x}$$

$$= \frac{\cancel{x}}{\cancel{x}(x-3)}$$ → nonremovable (VA)
discont @ x = 3

↘ removable @ x = 0
discont

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

$$f(0) = \frac{1}{0-3}$$
$$= -\frac{1}{3}$$

$f(x)$

$-\frac{1}{3}$ 3