

$$\Rightarrow -1 < x < 1$$

$$\Rightarrow -2 < x-1 < 0 \rightarrow \left[\begin{array}{l} \text{opposite sign, so inequality sign} \\ \text{will not change} \\ \text{Chas} \end{array} \right]$$

$$\Rightarrow -\frac{1}{2} < \frac{1}{x-1} < \frac{1}{0}$$

$$\Rightarrow -1 < \frac{2}{x-1} < \infty$$

$$\Rightarrow \text{~~the set~~} \quad \frac{2}{x-1} \in (-1, \infty)$$

$$\text{limit point} = [-1, \infty)$$

$$\text{Thus } \boxed{a = -1}$$

If a and b have the same nonzero sign, then

$$a < b \iff \frac{1}{a} > \frac{1}{b}$$

(i.e., taking reciprocals reverses the inequality).

If a and b have opposite (nonzero) signs, then

$$a < b \iff \frac{1}{a} < \frac{1}{b}$$

(i.e., taking reciprocals preserves the inequality).