

$$f(x) = \begin{cases} \frac{x^2-1}{x-1} & x \neq 1 \\ k & x = 1 \end{cases}$$

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

$$g(x) = x+1$$

$$\begin{aligned} x-1 &\neq 0 \\ \Rightarrow x-1 &\neq 0 \\ x &\neq 1 \\ \boxed{x \neq \frac{1}{x}} \end{aligned}$$

$$k+a = \frac{1}{x}$$

$$\lim_{x \rightarrow 1} g\left(\frac{1}{x}\right) = f\left(\frac{1}{x}\right)$$

$$|x| = \frac{1}{x} \Rightarrow k=0$$

$$f(x) = \begin{cases} \frac{x^2-4}{x+2} & x \neq -\frac{x}{2} \\ k & x = -\frac{x}{2} \end{cases}$$

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

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$$g(x) = x+b$$

$$x = -\frac{x}{2}$$

$$x+2 \neq 0$$

$$f\left(-\frac{x}{2}\right) = g\left(-\frac{x}{2}\right)$$

$$\begin{aligned} x+2 &\neq 0 \\ g(x) &= x+b \\ \frac{x+2}{x+2} &= \frac{x+b}{x+2} \\ \boxed{b=-2} \end{aligned}$$

$$-x+2 = -x+b$$

$$-x+2 = -x$$

$$-x+2 = -x$$

$$\boxed{a=2}$$

$$a-b = 2 - (-2) = \boxed{4}$$

$$f(x) = \begin{cases} \frac{x^2-4}{x-2} & x \neq 2 \\ k & x = 2 \end{cases}$$

$$\frac{(x+2)(x-2)}{(x-2)} = x+2$$

$$g(x) = x+2$$

$$x=2 \rightarrow g(2) = f(2)$$

$$x+2 = x+2 - f = 0$$

$$x+2 = x+2+2$$

$$a+a-b=0$$

$$f = x+2+2$$

$$a+b+c=0$$

$$\boxed{a=1, a=\frac{c}{a} = \frac{2}{1} = 2}$$

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

R-fiz \rightarrow $\frac{m^2-4}{4}$

$$\Delta \text{ sbt-fac} \rightarrow \Delta \text{ sm}^2 - f < 0$$

$$m^2 < 4$$

$$-2 < m < 2$$

$$f(x) = \sqrt{f - \frac{1}{x^2}}$$

$$x \neq 0$$

$$f - \frac{1}{x^2} \geq 0 \rightarrow f \geq \frac{1}{x^2}$$

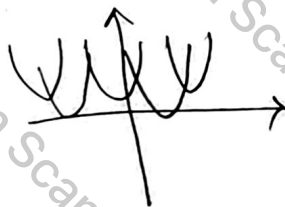
$$-2 \leq \frac{1}{x} \leq 2 \xrightarrow{\times x} -2x \leq 1 \leq 2x$$

$$-2x \leq 1 \rightarrow x \geq -\frac{1}{2}$$

$$1 \leq 2x \rightarrow x \geq \frac{1}{2}$$

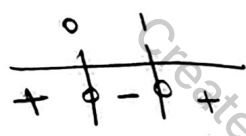
$$D = (-\infty, -\frac{1}{2}] \cup [\frac{1}{2}, \infty)$$

$$f(x) = \sqrt{\frac{mx^2 + 4mx + 1}{S \cdot P}}$$



$$\Delta < 0 \rightarrow fm^2 - fm < 0$$

$$m > 0 \rightarrow fm(m-1) < 0$$



$$S = \frac{b}{a} = \frac{-4m}{m} = -4$$

$$P = \frac{c}{a} = \frac{1}{m}$$

$$m \in [0, 1]$$

$$S = \frac{b}{a} = \frac{-4m}{m} = -4$$

$$P = \frac{c}{a} = \frac{1}{m}$$