

- Remove the absolute value for the function

$$f(x) = \frac{1}{|x|\sqrt{x^2 - 1}} \quad \text{for } |x| > 1$$

- Solve the following inequalities

$$\frac{3}{2x - 1} \leq 0 \quad x^2 - 9 \leq 0$$

- Evaluate the following limits

1. $\lim_{x \rightarrow \pi^+} \frac{\cos x}{x - \pi}$

2. $\lim_{x \rightarrow 0} \frac{\tan x - \sin x}{x^2}$

3. $\lim_{x \rightarrow 0} \frac{\cos(2x)}{|x|}$

4. $\lim_{x \rightarrow 1} f(x)$ where $f(x) = \begin{cases} \frac{\sin(x-1)}{x-1} & 0 \leq x < 1 \\ 1 & x = 1 \\ |x - 1| & x > 1 \end{cases}$

5. $\lim_{x \rightarrow \infty} \sqrt{x^2 + 1} - x$

- Determine the points of discontinuity of the following functions

1. $f(x) = \frac{|x|}{x} - 1$ for $x \neq 0$ & $f(0) = 1$

2.

$$f(x) = \begin{cases} x^4 - 1 & x \neq 0 \\ -0.99 & x = 0 \end{cases}$$

3. $f(x) = \frac{x^2 - 3x + 2}{x^3 - 1}$ for $x \neq 1$; $f(1) = -\frac{1}{3}$