

Directions:

Determine where  $f(x)$  is discontinuous; take the limit from the right and from the left.

Tips:

Is there a two-sided limit where  $f(x)$  is discontinuous?

Does a limit exist?

What does the limit tell you about the graph of  $f(x)$  at the point of discontinuity?

$$1.) \quad f(x) = \frac{\sin(2x)}{5x}$$

$$2.) \quad f(x) = x \sin\left(\frac{1}{x}\right)$$

$$3.) \quad f(x) = \cot(x)$$

$$4.) \quad f(x) = \frac{|x|}{x}$$

$$5.) \quad f(x) = \frac{xe^{-2x+1}}{x^2 + x}$$

$$6.) \quad f(x) = \frac{\sin(7x)}{\sin(3x)}$$

$$7.) \quad f(x) = \frac{4x}{\tan(x)}$$

$$8.) \quad f(x) = \cos\left(\frac{1}{x}\right)$$

$$9.) \quad f(x) = \frac{\sqrt{-4x^2 + 5x - 1}}{x - 1}$$

$$10.) \quad f(x) = \frac{\frac{1}{5} - \frac{1}{x^2}}{2x + 8}$$

$$11.) \quad f(x) = \begin{cases} \sqrt[3]{2x^2 + 7x + 4} & x \in (-\infty, 4) \\ 2x^2 - 6x - 7 & x \in [4, +\infty) \end{cases}$$

$$12.) \quad f(x) = e^{-\frac{4}{x^2}}$$

$$13.) \quad f(x) = \frac{\sin(x)}{x}$$

$$14.) \quad f(x) = \frac{\tan(x)}{x}$$

$$15.) \quad f(x) = e^{\frac{1}{x}}$$

$$16.) \quad f(x) = e^{-\tan(x)}$$

$$17.) \quad f(x) = \frac{\sin^2(x)}{3x^2}$$

$$18.) \quad f(x) = \frac{\sin(x)}{1 - \cos(x)}$$

$$19.) \quad f(x) = \ln[\tan(x)]$$