

Exercise 39

Determine the infinite limit.

$$\lim_{x \rightarrow 2\pi^-} x \csc x$$

Solution

Rewrite the given limit.

$$\lim_{x \rightarrow 2\pi^-} \frac{x}{\sin x}$$

Since x goes to 2π from the left, the numerator is positive and the denominator is negative. Therefore,

$$\lim_{x \rightarrow 2\pi^-} x \csc x = -\infty.$$

