Exercise 34

Locate the discontinuities of the function and illustrate by graphing.

$$y = \ln(\tan^2 x)$$

Solution

Because only the logarithm of a finite positive number can be taken, the function is undefined and therefore discontinuous wherever $\tan^2 x$ is zero or infinite.

$$\tan^2 x \neq 0 \quad \text{or} \quad \tan^2 x \neq \infty$$

$$\tan x \neq 0 \quad \text{or} \quad \tan x \neq \infty$$

$$x \neq n\pi \quad \text{or} \quad x \neq \frac{\pi}{2} + n\pi$$

Here $n = 0, \pm 1, \pm 2, \ldots$.