Locate the discontinuities of the function and illustrate by graphing.[1]

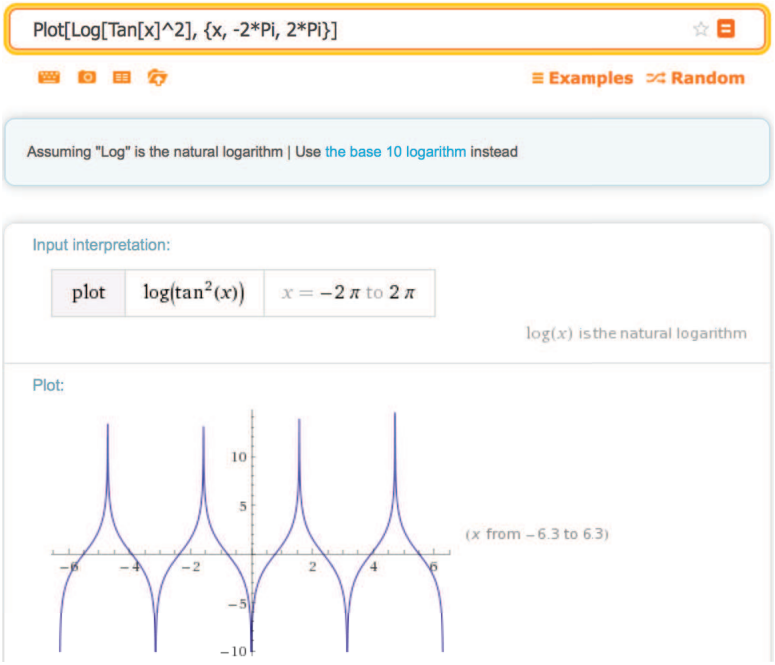
$$y = \ln\left(\tan^2(x)\right)$$

The function $y = \tan(x)$ is discontinuous wherever $\cos(x) = 0$. So $y = \tan(x)$ is discontinuous for $x = \frac{\pi}{2} + \pi k$, where k is an integer. Since $y = \tan(x)$ is discontinuous at these points, $y = \tan^2(x)$ is also discontinuous for $x = \frac{\pi}{2} + \pi k$.

Now $y = \ln\left(\tan^2(x)\right)$ will be discontinuous at the above points, but also where $\tan^2(x) = 0$. This happens where $\sin(x) = 0$, or for $x = k\pi$, where k is an integer.

Together, these tell us that $y = \ln\left(\tan^2(x)\right)$ is discontinuous for $x = \frac{\pi}{2} + \frac{\pi}{2}k$.

Using WolframAlpha, we get the graph



which clearly shows discontinuities (vertical asymptotes) at multiples of $x = \frac{\pi}{2} \approx 1.57$.

[1] Stewart, *Calculus, Early Transcendentals*, p. 125, #34.