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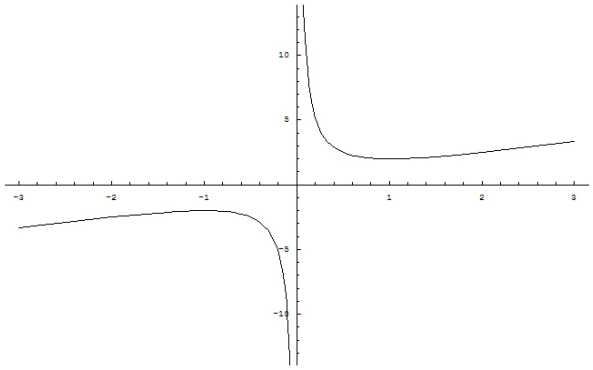
Solution to Problem 1055.

The graph of $g(x) = x + \frac{1}{x}$ is a pair of curves with asymptotes $x = 0$ and $y = x$, with local minimum at $(1, 2)$ for $x > 0$ and local maximum $(-1, -2)$ for $x < 0$.




The function,

$$f(x) = \begin{cases} (x - \frac{\pi}{2}) + \frac{1}{(x - \frac{\pi}{2})} - 2, & x > \frac{\pi}{2} \\ \tan x, & -\frac{\pi}{2} < x < -\frac{\pi}{2} \\ (x + \frac{\pi}{2}) + \frac{1}{(x + \frac{\pi}{2})} + 2, & x < -\frac{\pi}{2} \end{cases}$$

shifts the curve $g(x)$ for $x > 0$ down by 2 and to the right by $\frac{\pi}{2}$; for $x < 0$ up by 2 and to the left by $\frac{\pi}{2}$. To satisfy the problem's requirement, $\tan x$ is inserted between $-\frac{\pi}{2} < x < -\frac{\pi}{2}$.

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