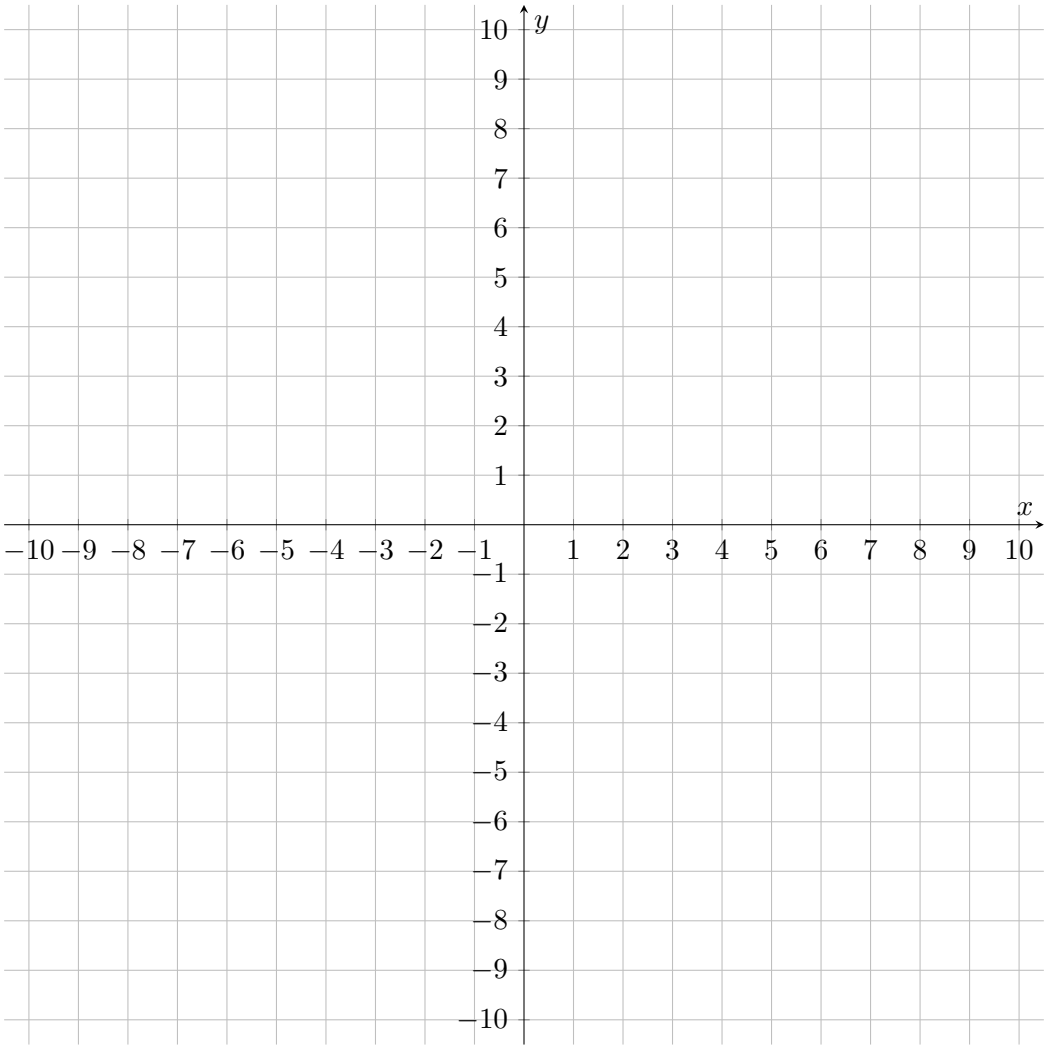
Name: _____

1. Find and sketch the domain of the function

$$f(x, y) = \ln(x^2 + y^2 - 16).$$

Be sure to make it clear whether or not the boundary of the region is included in the domain.



2. Show that

$$\lim_{(x,y)\to(0,0)} y \sin \tfrac{1}{x} = 0$$

by using the sandwich/squeeze theorem.

Hint: Let $f(x,y) = y \sin \frac{1}{x}$. The sandwich/squeeze theorem requires that you find functions $g(x,y)$ and $h(x,y)$ such that $g(x,y) \le f(x,y) \le h(x,y)$ always, and such that $g(x,y)$ and $h(x,y)$ have the same limit as $(x,y) \to (0,0)$.

Hint: The value of sine is always between -1 and 1.