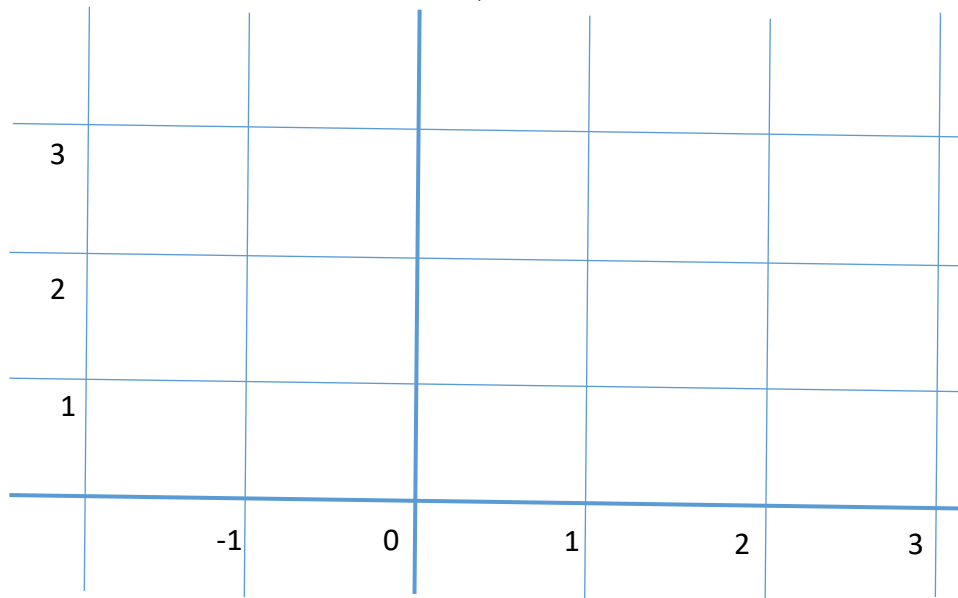## Math 241 Worksheet 4 (two-sided)

Name: _____   Section (circle one):   **3**   **4**

1. Sketch the graph of the function in the provided grid and from its graph, determine at what x values is the function discontinuous, and what are the types of discontinuity?

$$f(x) = \begin{cases} 2, & x < 0 \\ 2 - x, & 0 < x < 1 \\ x, & 1 \le x \le 2 \\ 3, & 2 < x \end{cases}$$

2. Where is the function $f(x) = \dfrac{\sin(x)}{x-3} + \dfrac{x-1}{x^2+9}$ continuous?

3. Using the definition of a derivative, for $f(x) = x^2$, find $f'(3)$.

4. Using the definition of a derivative, for $y = \frac{1}{x+2}$, find $\frac{dy}{dx}$.