Math 1300-005 - Spring 2017

Introduction to Limits, Pt. I - 1/23/17

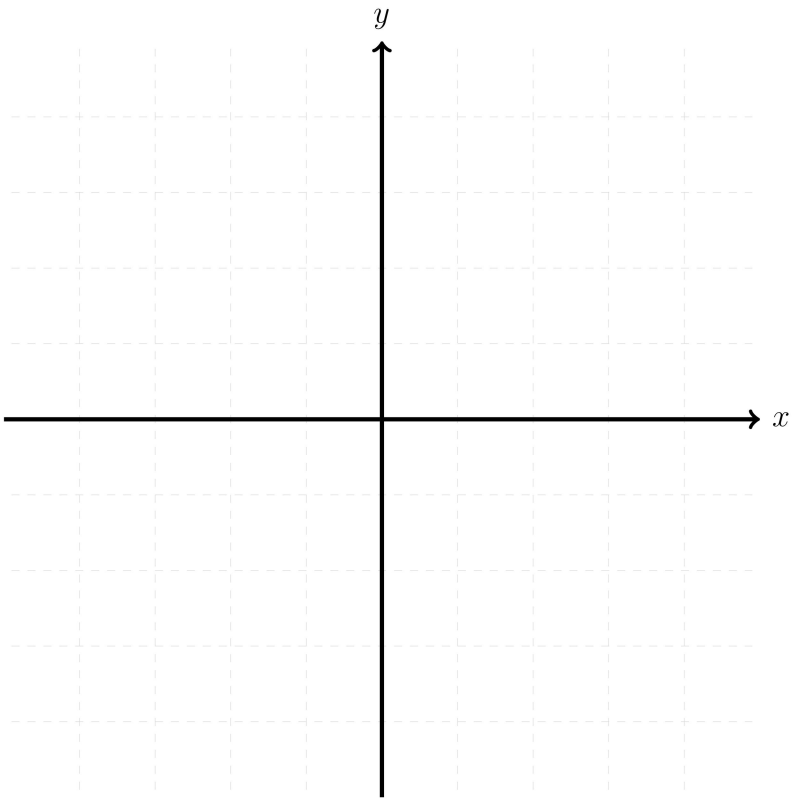
Guidelines: Please work in groups of two or three. Please show all work and clearly denote your answer.

1. Sketch the graph of the function and use it to determine the values of a for which

$$\lim_{x \to a} f(x)$$

exists. Please use interval notation for your answer.

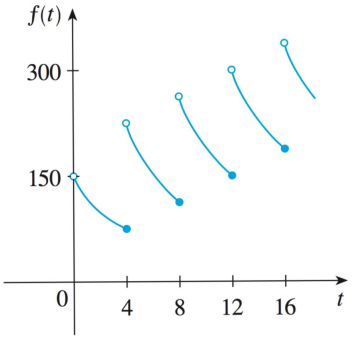
$$f(x) = \begin{cases} 1 + x & \text{if } x < -1 \\ x^2 & \text{if } -1 \leq x < 1 \\ 2 - x & \text{if } x \geq 1. \end{cases}$$



2. A patient receives a 150-mg injection of a drug every 4 hours. The graph below shows the amount $f(t)$ of drug in the bloodstream after t hours. Find

$$\lim_{t\to 12^-} f(t) \quad \text{and} \quad \lim_{t\to 12^+} f(t)$$

and explain the significance of these one-sided using complete sentences.



3. Sketch the graph of an example of a function f that satisfies

$$\lim_{x\to 0} f(x) = 1, \quad \lim_{x\to 3^-} f(x) = -2, \quad \lim_{x\to 3^+} f(x) = 2,$$
$$f(0) = -1, \quad f(3) = 1.$$