

Quiz 1 Outline

Format. This quiz has **3 multiple-choice** questions and **1 free-response** question.

1. (2 points) Calculate the value of a limit from a table.

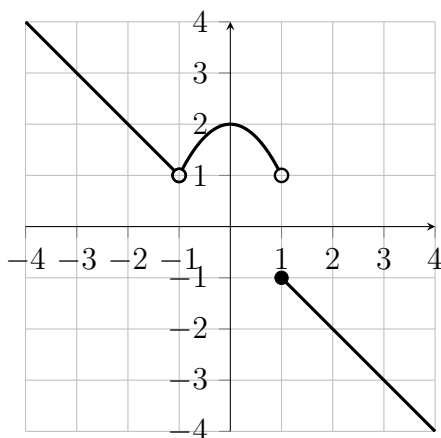
Example (Spring 2022 Exam 1 #5): Consider a function f that has values given in the following table:

x	3.0001	3.001	3.01	3.1	4
$f(x)$	5.9999	5.9987	5.9239	5.7682	5

From the above information, what can you conclude about $f(x)$ at $x = 3$?

- A. $f(x)$ is undefined at $x = 3$.
 - B. $f(x)$ approaches 6 as x approaches 3 from the left.
 - C. $f(x)$ approaches 6 as x approaches 3 from the right.
 - D. $f(3) = 6$.
 - E. $f(x)$ approaches 6 as x approaches 3 from both sides.
2. (2 points) Calculate a limit using limit laws, using graphs and/or expressions.

Example (Fall 2019 Exam 1 #5): Use the graph of $y = f(x)$ and the expression for $g(x)$ to calculate the limits.



$$y = f(x)$$

$$g(x) = \begin{cases} -2x^2, & \text{if } x < 0, \\ 3, & \text{if } 0 \leq x \leq 1, \\ 4 + x, & \text{if } x > 1. \end{cases}$$

$$\lim_{x \rightarrow -1} (f(x) \cdot g(x)) =$$

- A. -2
- B. -6
- C. 3
- D. 1
- E. The limit does not exist

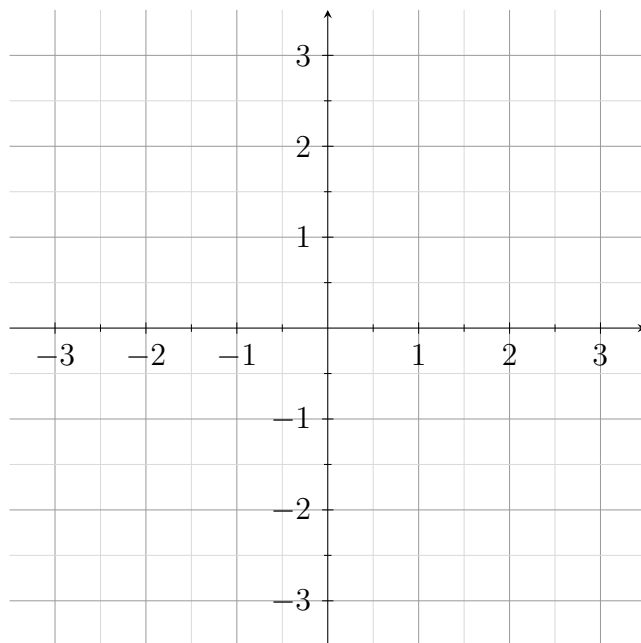
3. (2 points) Compute a limit using algebraic simplification (rationalizing or “factor and cancel”).

Example (Fall 2019 Exam 1 #11): Compute $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 - 3x}$ if it exists.

- A. $\frac{5}{3}$
- B. 0
- C. 1
- D. $-\frac{7}{3}$
- E. The limit does not exist

4. (4 points) Draw the graph of a function f satisfying several conditions.

Example (Fall 2019 Exam 1 #24): Draw the graph of a function f , whose domain contains $[-3, 3]$, that satisfies the seven properties below. Sketch your graph on the grid.



- $f(1) = 1$
- $f(3) = -2$
- $f(-2) = 1$
- $\lim_{x \rightarrow -2^+} f(x) = -1$
- $\lim_{x \rightarrow -2^-} f(x) = 1$
- $\lim_{x \rightarrow 1} f(x) = 2$
- $\lim_{x \rightarrow 3^-} f(x) = -2$