

## Quiz 1: The Idea of Limits (§2.1-2.2)

**Directions:** You have 30 minutes to complete this quiz. This quiz is open resources.

1. Given the equation  $f(x) = x^3 - x^2$ ,

(a) determine the slope of the secant line between the following  $x$ -coordinates:

i.  $[1, 1.5]$

iii.  $[1, 1.005]$

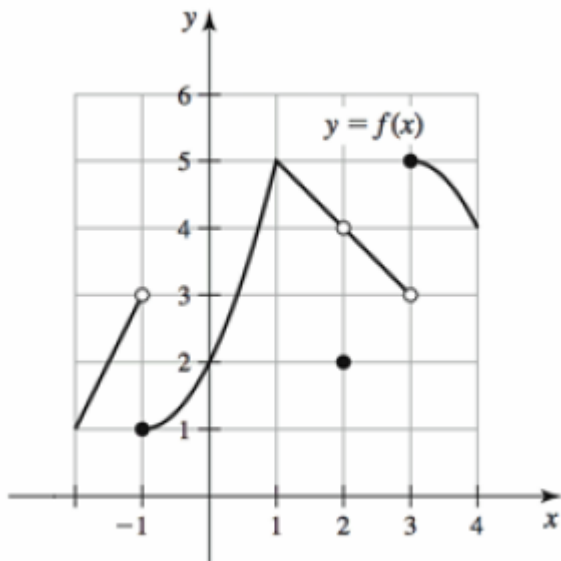
ii.  $[1, 1.05]$

iv.  $[1, h]$ , assuming  $h > 1$

(b) then use your answers from (a) to estimate the slope of the tangent line to  $f(x)$  at  $x = 1$ ;

(c) using the limit symbol, how would you express your conclusion in part (b)?

2. Use the graph of  $f$  in the figure below to find the following values. If it is not possible, then say so.



(a)  $f(-1)$

(b)  $\lim_{x \rightarrow -1^-} f(x)$

(c)  $\lim_{x \rightarrow 3^+} f(x)$

(d)  $\lim_{x \rightarrow -1^+} f(x)$

(e)  $\lim_{x \rightarrow 3} f(x)$

3. Sketch the graph of a function satisfying all of the following:

- $f(2) = 4$
- $f(-1) = 0$
- $\lim_{x \rightarrow 2^+} f(x) = -3$
- $\lim_{x \rightarrow 2^-} f(x) = 5$