

Math 114 Spring 2017
Calculus I HW 2
Due Friday, February 3

1. Based on the graphs below, estimate the following limits:

- (a) $\lim_{x \rightarrow 1} f(x)$
- (b) $\lim_{x \rightarrow -2} g(x)$
- (c) $\lim_{x \rightarrow 1} h(x)$
- (d) $\lim_{x \rightarrow 1} j(x)$

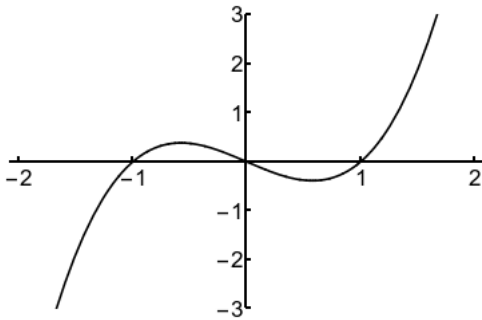


Figure 1: $f(x)$

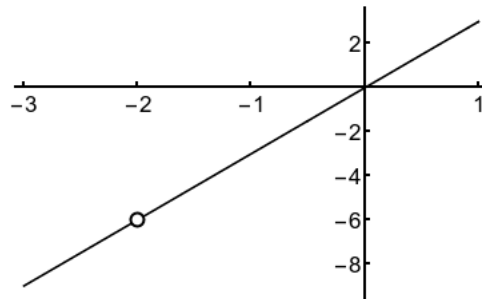


Figure 2: $g(x)$

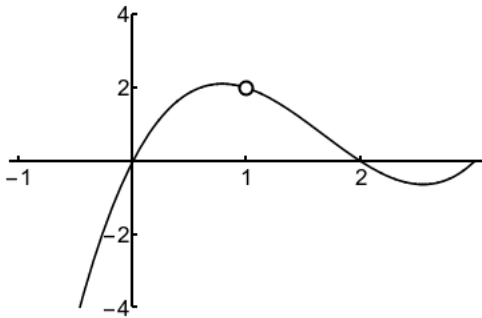


Figure 3: $h(x)$

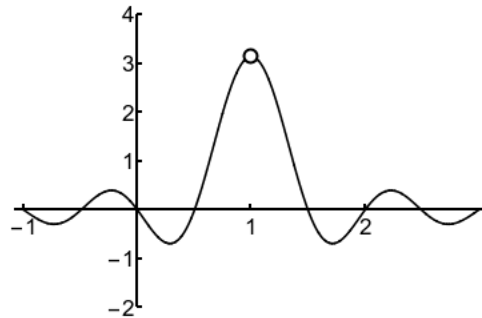


Figure 4: $j(x)$

2. Let $f(x) = 2x + 1$, and let $L = 3$.
- (a) Suppose we have an error margin of $\epsilon = 1/10$, that is, we would like the distance between $f(x)$ and L to be less than $1/10$. What open interval does x need to be in to make this happen?
 - (b) Now suppose our error margin is $1/50$. Give an open interval for x so that this happens.
3. Find, with proof, $\lim_{x \rightarrow 3} 4x$.
4. Find, with proof, $\lim_{x \rightarrow 2} (x + 1)^2$.
5. Find, with proof, $\lim_{x \rightarrow 1} x^2$.
6. Find, with proof, $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$.
7. \star Find, with proof, $\lim_{x \rightarrow 2} \frac{1}{x - 1}$.
8. (\star) Find (with proof) $\lim_{x \rightarrow 5} \frac{1}{x - 4}$.