

Math 114 Fall 2018
Calculus I HW 1
Due Wednesday, September 5

1. (a) Find two real numbers that solve $x^2 + 7x + 5 = 0$.
(b) Factor $x^3 - 27$.
2. 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) $\lim_{x \rightarrow 1} j(x)$

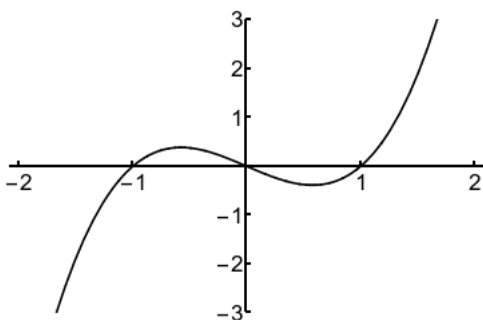


Figure 1: $f(x)$

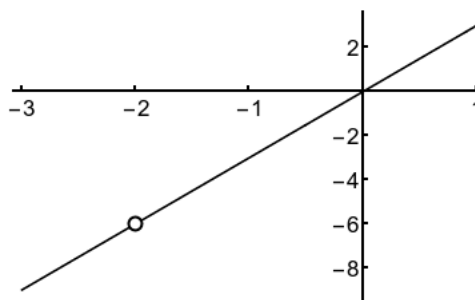


Figure 2: $g(x)$

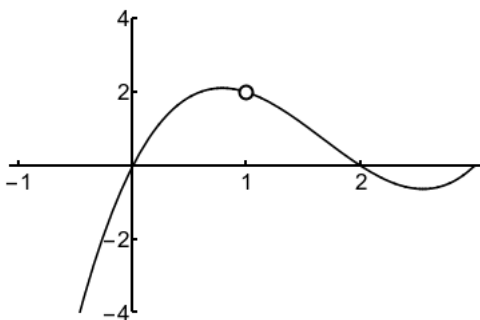


Figure 3: $h(x)$

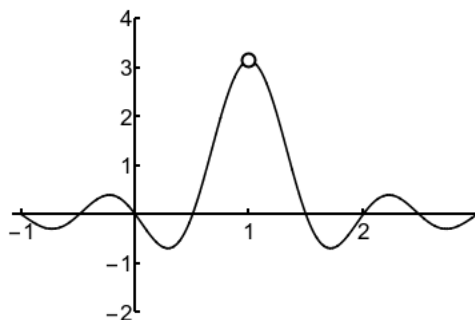


Figure 4: $j(x)$

3. If $|f(x)| \leq |x|$ and $|g(x)| \leq 7 + x^2$, what can we say about $|f(x) + g(x)|$ using the triangle inequalities? You should give three separate answers.
4. If $|f(x)| \geq 7$ and $|g(x)| \leq 3$, what can we say about $|f(x) + g(x)|$ using the triangle inequalities? You should give three separate answers.
5. ★
- (a) Find a pair of real numbers x and y such that $|x + y| < |x| + |y|$.
 - (b) Find a pair of real numbers x and y such that $|x + y| = |x| + |y|$.
 - (c) Find a pair of real numbers x and y such that $|x + y| > x + y$.
6. ★
- (a) Find a pair of real numbers x and y such that $|x + y| > |x| - |y|$.
 - (b) Find a pair of real numbers x and y such that $|x + y| = |x| - |y|$.
 - (c) Find a pair of real numbers x and y such that $|x + y| < x - y$.