Infinite Limits Study Group Activity
(Groups of 3 or 4 people)

**Purpose of activity:** Gain a deeper understanding of infinite limits and limits at infinity by solving a problem on your own and then teaching it to your peers.

**Due Date:** Monday September 10th.

**Individual Portion:** Everybody in the group should choose ONE of the problems below. Solve your problem on your own before you meet with your group.

\[
\lim_{x \to \infty} \left( \sqrt{x^2 + 1} - x \right)
\]

\[
\lim_{x \to \infty} \sqrt{x^2 + x + 1} + x
\]

\[
\lim_{x \to 3} \frac{(x + 2)(x - 3)^2(x - 4)^3}{x(x - 1)(x - 2)^2}
\]

Sketch a graph of a function satisfying the three properties below.

a) \( f(1) = 3 \)

b) \( \lim_{x \to 1^-} f(x) = \infty \)

c) \( \lim_{x \to 1^+} f(x) \) exists

**Group Portion:** Take turns teaching your problem to the rest of the group. Use a whiteboard to clearly show each step to your groupmates. Record your teaching using a phone or camera.

**Assessment:** Upload your video to Blackboard.