1. What does it mean for the limit of $f(x)$ as x approaches 0 to be equal to L, or
$$\lim_{x \to 0} f(x) = L?$$

2. Consider the function $f(x) = \sin \frac{1}{x}$. Find a sequence of x's that are positive, get closer and closer to zero, and have $f(x) = 1$. Hint: Think about for what values of y we have $\sin y = 1$. For each of these $\frac{1}{y}$ will be an x value that works for this problem.

3. Find a similar sequence of x values where $f(x) = -1$.

4. Find a similar sequence of x values where $f(x) = 0$.

5. What does this mean for $\lim_{x \to 0} f(x)$? Think about what the definition of limit says.