

The following questions will be included in the midterm exam 1.
Each would be of 10 points.

- By using the squeeze theorem(i.e. the sandwich lemma), can you prove that: $\lim_{x \rightarrow 0} x \sin \frac{1}{x} = 0$?
- For the function $f(x) = \frac{|x|}{x}$, do you understand how to argue nonexistence of limit as x approaches to 0?
- Can you prove the existence of a root of a polynomial in a closed interval by *precisely* using the intermediate value theorem?