

Homework Assignment for Week 01

Assigned Sep 15, 2011.

1. Section 2.2: problems 25, 55, 72(b).
2. Section 2.3: problems 23, 33, 40, 46.
3. State (need not prove) the ' $x \rightarrow c^+$ ' and ' $x \rightarrow \infty$ ' versions of the Sandwich Theorem. Part of the assumption in the standard Sandwich Theorem reads

... for all $x \neq c$ in some open interval about c ...

How would you change this sentence in the ' $x \rightarrow c^+$ ' and ' $x \rightarrow \infty$ ' versions, respectively?

4. Section 2.4: problems 54, 55, 56, 57.
5. Chap 2: problems 41, 42, 53, 69, 70.
6. Read section 2.5 in advance. This may be the most difficult section in the first half of the semester!
7. For those of you who are really not confident about your high school mathematics, pick some among section 2.3 problems 1-22, 35-40, section 2.4 problems 37-48 and practice yourself. Normally you don't need this.

8. Evaluate $\lim_{\theta \rightarrow \pi/6} \frac{\sin \theta - 1/2}{\theta - \pi/6}$

9. (Challenge of the week, optional)

Let $f : (0, 1) \rightarrow \mathbb{R}$ be defined as

$$f(x) = \begin{cases} 1/p & \text{if } x = q/p, \quad p, q \in \mathbb{N}, \quad (p, q) = 1 \\ 0 & \text{otherwise} \end{cases}$$

For what values of $c \in (0, 1)$ is f continuous at c ?