

Homework 3

The following are due on Monday, January 29:

§2.2 #25 (you are allowed to use facts from Calc 1, such as $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$... to actually prove this part, you would need to consider Taylor series),

#33,

Bonus Problem: An n -variable function $f : U \rightarrow \mathbb{R}$ is called *homogeneous of degree d* if $f(\lambda \mathbf{x}) = \lambda^d f(\mathbf{x})$ for all $\lambda \in \mathbb{R}$, all $\mathbf{x} \in U \subseteq \mathbb{R}^n$. (5 points) If f is defined everywhere, what can you say about $\lim_{\mathbf{x} \rightarrow \mathbf{0}} f(\mathbf{x})$ (answer may depend on d). (5 points) What happens when $d = 0$? Please give examples.

§2.3 #1, 5, 8, 10, 16, 22, 25, 27.

§2.4 #6, 8, 23, 25.