Homework 9 additional problems.

1. Let $F(x) = x\sin(1/x)$ for $x \neq 0$ and $F(0) = 0$. Find $\overline{D^+}F(0)$, $\overline{D^-}F(0)$, $\underline{D^+}F(0)$, and $\underline{D^-}F(0)$.

2. Let $F : [a, b] \to \mathbb{R}$ be a continuous function and assume F has a local minimum at $c \in (a, b)$. Prove that
$$\overline{D^-}F(c) \leq 0 \leq \underline{D^+}F(c).$$