Homework to be done by September 30th

Section 2.2: Problems 7, 9, 10, 13, 18, 33*, 34*.
Section 2.3: Problems 3, 21, 22, 31 (assume that a and b are not zero), 37, 55*.
Section 2.4: Problems 7, 15, 36, 48*

* Good problems to be discussed in class.

Problems to be handed in on September 30th

1. Evaluate

\[ \lim_{x \to 4} \left[ \frac{\sqrt{x} - 2}{(x - 4)^2} - \frac{1}{x^2 - 4x} \right]. \]

Hint: The limit does exist and it is not zero.

2. Suppose that the function \( f \) has the property the following property

\[ |f(y) - f(x)| \leq \frac{1}{2} |y - x| \quad \text{for all} \quad x, y \in (0, 1). \]

2.1 Prove that \( f \) is continuous on \((0, 1)\).

2.2 Suppose that \( \lim_{y \to 0^+} f(y) = 0 \). Show that for every \( x \in (0, 1) \),

\[ -\frac{1}{2} \leq f(x) \leq \frac{1}{2}. \]