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

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

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 $x\in(0,1)$,

$$-\frac{1}{2}\le f(x)\le\frac{1}{2}.$$