

## Homework #27.

Read pp. 129 - 133 and pp. 136 - 139

Do the following problems:

1. For each function below decide if the function is uniformly continuous on a given interval. Justify your answer.

a)  $f(x) = \cos\left(\frac{1}{x}\right)$  on  $(0, 1)$ ;

b)  $g(x) = \begin{cases} x \cos\left(\frac{1}{x}\right), & x \neq 0 \\ 0, & x = 0 \end{cases}$  on  $[0, 1]$ ;

c)  $h(x) = \sqrt{x}$  on  $[0, +\infty)$

2. Do # 4.4.5, 4.4.6, 4.5.7.

Hint for 4.5.7: Consider  $g(x) = f(x) - x$  and argue that  $g(0) \geq 0$  and  $g(1) \leq 0$ .