King Fahd University of Petroleum and Minerals
Prep-Year Math Program
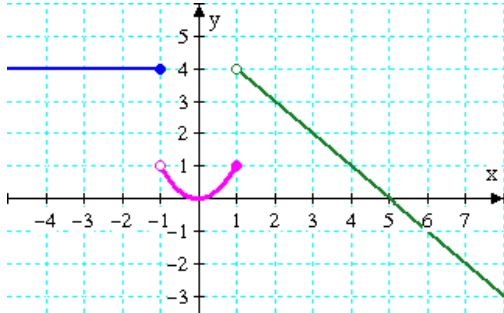## Math 001 - Term 131
Recitation 2.6

Question 1. If $[a,b]$ is the largest interval on which the function

$$f(x) = \begin{cases} 4 & ; & x \le -1 \\ x^2 & ; & -1 < x \le 1, \\ -x+5 & ; & x > 1 \end{cases} \quad \text{is increasing, then } a+b =$$

A) 4   B) 1   C) 2   D) 0   E) –1

The function $f(x)$ is increasing on $[0,1]$ $\Rightarrow$ $[0,1]=[a,b]$ $a+b=0+1=1$.

Answer: B) 1

Question 2. If $f(x) = \begin{cases} x^2 & ; & x \le 1 \\ 1-2x & ; & 1 < x < 4, \\ \sqrt{x} & ; & x \ge 4 \end{cases}$ sketch the graph of $f(x)$, and fine

    a)   Domain of $f(x)$
    b)   Range of $f(x)$
    c)   Interval where the function is: i) increasing, ii) decreasing
    d) $f(-1)+f(2)+f(4)$

Answer: **a):** $D_f = (-\infty,\infty)$

(b): $R_f = (-7,-1)\cup[0,\infty)$

(c): (i): increasing on $[0,1]$ and on $[4,\infty)$.

     (ii): decreasing on $(-\infty,0]$ and on $(1,4)$.

(d): $f(-1)+f(2)+f(4)=0$

Question 3: If $f(x) = \left\llbracket 1-\dfrac{x}{2} \right\rrbracket$, sketch the graph of $f(x)$ and find

         a) $x-$ and y- intercepts
         b) $f(-2.4)+f(2.006)$

(a): $x-$int: $\{x \mid 0 < x \le 2\}$ $y-$int: $y=1$

(b): $f(-2.4)+f(2.006) = 2-1 = 1$