HOMEWORK 4 - MATH 140

DUE DATE: Wednesday, September 29
INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. One part of each homework problem will be chosen at random and graded. Each question is worth 1 point. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Find the real solutions of each equation:
   (a) $\sqrt{3x-5}-\sqrt{x+7}=2$
   (b) $\sqrt[7]{2x+1}-2=0$
2. Solve the following equations:
   (a) $|\frac{x}{2}-\frac{1}{3}|=1$
   (b) $|x^2+x|=12$
3. Solve each inequality and then graph and express in interval notation its solution set:
   (a) $|2-3x|>|-1|$
   (b) $|-2x+3|\leq 0.001$
4. By using the table method, roughly sketch the graph of
$$f(x)=\begin{cases} x+3, & \text{if } x<-2 \\ -2x-3, & \text{if } x\geq -2 \end{cases}$$
   Give the domain of f and the range of f.
5. By using the table method, roughly sketch the graph of
$$f(x)=\begin{cases} 3+x, & \text{if } -3\leq x<0 \\ 1, & \text{if } x=0 \\ \sqrt{x}, & \text{if } x>0 \end{cases}$$
   Give the domain of f and the range of f.
6. Use transformations to roughly sketch the graph of the function $f(x)=(x-1)^3+2$.
7. Use transformations to roughly sketch the graph of the function $f(x)=\sqrt{x-2}+1$.
8. Let $P=(x,y)$ be a point on the graph of $y=-x^2-8$.
   (a) Express the distance d from P to the point $(0,-1)$ as a function of x.
   (b) What is d if $x=0$?
   (c) Graph the function $d=d(x)$ using your calculators. (Draw the graph for me cleanly, giving some key points.)
   (d) For what values of x is d smallest?