Honors Analysis Name _____

Copy the original problem.
Convince *me* that **you** understand the concept. Per _____ Date _____
No Calculators, of course. **C H A P T E R # 1**

I State the Domain only for each of the following: (5 pts ea)

a) $A(x) = \dfrac{\sqrt{x+3}}{x^2 + x}$ b) $B(x) = \sqrt{\dfrac{1}{x} - x}$ c) $C(x) = \dfrac{4(x+1)}{(x-1)(x+1)}$ d) $D(x) = \sqrt{-(x-3)(x+1)}$

II For each of the following, re-define as a "piece-meal" function. Sketch a graph. (10 pts ea)

a) $A(x) = (\text{Sgn}(x))^2 - x + 1$ b) $B(x) = |x+1|\,\text{Sgn}(x - 2)$ c) $C(x) = |x+1| + |x-1|$

III Let [x] mean the Greatest Integer Function. Re-define the following as a "piece-meal" function. Graph the function given the domain: D_A $-2 \le x \le 2$. (10 pts)

$A(x) = 2^{[x]} + 1$

IV Given point A with coordinates (2, 2), find the point B (coordinates (x,y)) such that the slope of the line AB is 2 and the distance from point A to point B is 2. (15 pts)

V Given: $F(x) = \dfrac{2x+3}{5x-2}$ and $G(x) = \dfrac{2x+3}{x}$ (5 pts ea)

A) Using the "inverse method", find the range of $F(x)$.

B) Using the "inverse method", find the range of $G(x)$.

C) Prove $F(x)$ is or is not a 1-to-1 function. Specifically state your conclusion.

D) Find the domain of $H(x)$ given: $H(x) = F(G(x))$.

E) Find the domain of $J(x)$ given: $J(x) = \sqrt{\dfrac{1}{F(x)} + \dfrac{1}{G(x)}}$.

EXTRA CREDIT 5 pts

Sketch the graph of: $y = \left| \dfrac{x^3 - x^2 - 2x + 2}{x - 1} \right|$. Consider x values: $-3 \le x \le 3$