

# Honors Analysis

Name \_\_\_\_\_

Copy original problem.

Per \_\_\_\_\_

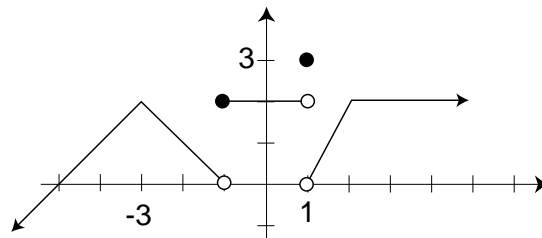
Date \_\_\_\_\_

Convince *me* that **you** understand the concept!**No Calculators!**

## Chapter 1 Exam

**I** Solve and graph solution on a number line:  $\left| \frac{x+1}{x} - 3 \right| \leq 6$  (15 pts)

**II** Given the graph of the piecewise function, write the function itself (20 pts)



**III** Rewrite the function as a piecewise function and sketch the graph. (10 pts ea)

a)  $A(x) = ||x - 2| + |x + 3||$

b)  $B(x) = (\text{sgn}(x + 2))^{\text{sgn}(x - 3)}$

**IV** Given the function, state the Domain of the function:  $f(x) = \sqrt{\frac{\text{sgn}(6 + x - x^2)}{2x + 1}}$  (15 pts tot)

**V** The coordinates of the vertices of a right triangle are:  $P_1(0,0)$ ,  $P_2(a,0)$ , and  $P_3(0,b)$ . (15 pts)  
Show that the midpoint of the hypotenuse is equidistant from all three vertices.  
Be *very* clear.

**VI** Given  $f(x)$ , prove  $f$  is a 1 : 1 function:  $f(x) = \frac{3 - 2x}{5x + 2}$  (15 pts)

**Extra Credit** ----- 5 pts -----

What is the Domain and Range of the function  $y$  given:  $2y = 10 \sin\left(3\theta - \frac{\pi}{6}\right) + 4$