Last Name, First Name	Discussion Section	Student ID

Worksheet 2 • Working with Piecewise Functions

1. Piecewise defined functions f and g are said to be defined on commensurable domains if they are given explicitly by formulas on the same intervals. Suppose that

$$f(x) = \begin{cases} -2x+1 & \text{if } x < 0 \\ 3x+2 & \text{if } x \geq 0 \end{cases} \quad \text{and} \quad g(x) = \begin{cases} x+4 & \text{if } x < 2 \\ 2 & \text{if } x \geq 2. \end{cases}$$

Describe f and g as piecewise functions defined on commensurable domains. Use this to find all x with

$$f(x) = g(x).$$

2. Given the functions f and g above, use the description of f and g as functions defined on commensurable domains to find all x with

$$f(x) < g(x).$$

3. The piecewise defined function h is defined by

$$h(x) = \begin{cases} x+5 & \text{if } x < 2 \\ 10-x & \text{if } x \geq 2. \end{cases}$$

Find all x such that

$$h(x) < 0.$$

Find all x such that

$$h(x) \geq 0.$$

4. The function h is defined by a formula on the intervals $(-\infty, 2)$ and $[2, \infty)$. Intersect these intervals with the intervals you found in the previous problem.

5. For the function h above, write the function F given by

$$F(x) = |h(x)|$$

as a piecewise defined function.

6. Why might you need to write F as a piecewise defined function? Find all solutions to

$$F(x) = |2x-5|.$$