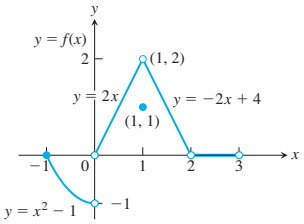
ACMAT161 Summer 2024
Professor Manguba-Glover
Homework 7 Name: _____

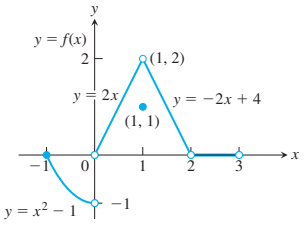
Show all work and simplify all answers before circling/boxing them. If you do the problem incorrectly, or don't show sufficient work, you will be asked to rewrite the problem for full credit.

Due next class. Students who turn assignments in late (or do not attempt a problem) forfeit their ability to rewrite those problems for credit.

1. For what x values is the function discontinuous? Explain which continuity condition it fails.



2. On what interval(s) is the following function $f(x)$ continuous?



3. Is $f(x)$ continuous at $x = 1$ if $f(x) = \begin{cases} 8x - 3 & x \le 1 \\ 4x^2 + 5 & x > 1 \end{cases}$? If not, is it continuous from the left, right, or neither?

4. Find the number(s) at which f is discontinuous, determine if they are continuous from the left, right, or neither, then write down on what intervals f is continous:

$$f(x) = \begin{cases} x^2 & \text{if } x < -1 \\ x & \text{if } -1 \le x < 1 \\ \frac{1}{x} & \text{if } x \ge 1 \end{cases}$$

5. For what value of a is

$$f(x) = \begin{cases} x^2 - 1 & \text{if } x < 3 \\ 2ax & \text{if } x \ge 3 \end{cases}$$

continuous at every x?

6. Show that the equation $x^3 - 15x + 1 = 0$ has three solutions (i.e. you'll have to use IVT multiple times).