DIRECTIONS:

- No papers, phones, calculators, or gadgets are permitted to be out during the quiz.

- Show all work, clearly and in order **You will lose points if any of these instructions are not followed.**

Questions	Points	Score
1	1	
2	2	
3	2	
Total	5	

Problem 1: (1 point) Calculate the average rate of change of the function $f(x) = x^2 - 2$ on the interval $[1, 3]$.

The average rate of change is given by

$$\frac{f(3) - f(1)}{3 - 1} = \frac{8}{2} = 4.$$

Problem 2: (2 points) Consider the invertible function $f : [1, \infty) \to [0, \infty)$ where $f(x) = (x - 1)^2$. Find f^{-1} and graph both f and f^{-1}.

To find f^{-1} set $x = (y - 1)^2$ and solve for y to find $f^{-1}(x) = y = 1 + \sqrt{x}$. To plot, graph f and reflect about the line $y = x$.

Problem 3: (2 points) For each of the following, mark the statement as either true (T) or false (F).

(a) (0.5 points) All functions are invertible.   "_____F_____."

(b) (0.5 points) Let f be an invertible function, then the domain of f is equal to the range of f^{-1}.
"_____T_____."

(c) (0.5 points) If f and g are functions then the product $f \cdot g$ is also a function.   "_____T_____."

(d) (0.5 points) All mathematical statements can be proven either true or false with either an example or a counter example.   "_____F_____."