

Quiz #4

Name: _____

READ AND FOLLOW ALL DIRECTIONS. CIRCLE YOUR FINAL ANSWERS.
SHOW ALL WORK TO RECEIVE FULL CREDIT. NO CALCULATORS.

1. (2 points) A **relation** is a correspondence between two sets, or a collection of ordered pairs $\{(x, y) : x \in X, y \in Y\}$. Define the term **function** based on this definition of a relation.

2. (2 points) Does the relation $\{(1, 4), (2, 3), (3, 1), (1, 6)\}$ represent a function? Why or why not?

3. (2 points each) Write the function whose graph is the graph of $f(x) = x^2$, but is:
 - (a) Shifted up 4 units.

 - (b) Horizontally stretched by a factor of 4.

 - (c) Reflected over the x-axis.

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- (d) Reflected over the y-axis.
4. (2 points each) Let $f(x) = 3x^2 + 5$ and $g(x) = 2x + 1$. The domains of f and g are all real numbers.
- (a) What is $(f - g)(x)$?
- (b) What is $(f/g)(x)$?
- (c) What is the domain of $(f/g)(x)$.
- (d) Find $(f - g)(3)$ and $(f/g)(0)$.
5. (1 point) EXTRA CREDIT. Suppose $f(x) = x^2 - 2$ and $g(x) = 5x$. Find $(f \circ g)(x)$