

Quiz 3 Review

This quiz will be very similar to Quiz 1 & 2 in the types and length of questions. You should be able to answer all of the questions below. The material will focus primarily on what has been covered since the midterm with the exception of complex zeros and absolute value equations. As usual I will provide equations to you within reason but not all of them. You are expected to know slope, quadratic formula, area of a square, area of a circle.

1. Be able to find a difference quotient. If $f(x) = 3x^2 - 2x + 3$, then find $\frac{f(x+h)-f(x)}{h}$.

2. Be able to **quickly sketch** all of the functions from the library of functions as well as various transformations. You should be able to determine the domains and ranges of all of these. This will include horizontal and vertical shifts, vertical/horizontal stretches and compressions, and reflections over both the x and y axis. For example graph the following and state their domains:

a. $y = 2^x - 3$

b. $y = \frac{1}{x-2}$

c. $y = -2(x+1)^3$

3. For $f(x) = \sqrt{x-1}$ and $g(x) = 2x + 5$, be able to find the following

a. $f(g(x))$ - what is the domain?

b. $g(f(x))$ - what is the domain

c. $g(g(3))$

4. Know the conditions for being able to find an inverse. What kind of function must we have? Be able to clearly illustrate a mapping, graph, or other representation of a one-to-one function and be able to describe why it is a necessary condition for defining the inverse. What kind of "test" must a graph pass to be a one-to-one function

a. If $f(x) = \frac{1}{x-3}$, then find $f^{-1}(x)$.

b. $f(x) = (x-2)^2$. Limit the domain to make $f(x)$ a one to one function. Solve for the inverse. What are the domain and range of $f^{-1}(x)$?

c. $f(x) = \frac{(3x+2)}{x-1}$ find $f^{-1}(x)$. What are the domains and ranges of each?

5. Be able to answer a basic interest question. I will provide the formulas necessary for this. For example- you have \$2000 dollars to invest and it will return an annual 6% interest that is compounded quarterly (think about what this means). How much money will you have after 3 years?
6. Be able to solve for the complex roots of a quadratic equation. What can we use to determine if a quadratic function has only 2 real zeros, one real zero, or no real zeros? If there is only one real zero, what would the multiplicity of that zero be (for a quadratic equation).
7. Know your exponential and rational radical properties. Be able to simplify a radical into an expression with only positive exponents.
8. Graph the following and be able to answer questions: $f(x) = -|x + 2| - 3$
- Is this graph smooth? Is it continuous?
 - When performing transformations, think of staying in the same order as PEMDAS
 - solve for $f(x) < 0$, $f(x) > -10$
 - In your own words what does an absolute find?

If you need any more problems to help practice, check out any of the even problems from sections we have had homework from, chapter reviews, or you can email me with other questions. Good luck studying!