

Math 1410: Study Guide for Midterm 2

October 10, 2022

The midterm is similar in structure and length to the previous midterm. Expect similar sorts of questions. As before, the online homework questions should prepare you for what to expect to see on the exam.

The problems on the exam are broken up by learning objective. This unit we've been looking mainly at polynomial and rational functions, so you should know how to work with them for each learning objective. For this exam there will be the six learning objectives you saw on the previous exam, plus the objective Inequalities and functions.

Specific things you should know for the exam:

- You should be able to find the ARC from x to $x + h$ of a cubic or quartic power function.
- You should be able to find the ARC from x to $x + h$ of either of the parent functions $f(x) = \sqrt{x}$ or $f(x) = 1/x$. You can pick the one to work. The problem will be on the test. You can select which one to work.
- Be able to solve a rational equation to answer question about point-wise behavior of a rational function. This was in a review assignment. Dont overlook it.
- Also make sure that you can solve radical, power, and rational equations.
- Make sure you can find the limits of rational functions related to the asymptotes and holes. Also, make sure you can find asymptotes, intercepts, holes, domain, etc.
- Be able to analyze the equation of a non-power and power polynomial functions to answer questions about the function.
- Be able to graph and answer questions about the behavior of power, radical, and rational functions that can be graphed from transformations of the parent functions. You should expect to have to graph two of these three by hand and answer questions about the behavior of all three of these.
- There will be a polynomial and rational graphing matching sections related to graphing functions that are not transformations of the parent function. Each section will have six graphs and nine equations. Not every equation will be used.
- Be able to rewrite a power function in the form $y = ax^n$ and use exponent rules to simplify and convert between radicals and exponents. This was in a review assignment. Dont overlook it.
- Know the rules for domain. Remember: with domain the question you should ask is, what could go wrong with evaluating this function? For what we've seen, there's two things you should look out for. (1) dividing by 0; and (2) taking a square root (or even power root) of a negative number.
- Be able to create a sign diagram and be able to answer questions using the sign diagram you made.
- Be able to simplify a rational function, writing the restriction in the domain. Be able to find the coordinates of the hole and know how this connects to a limit at the related value of x .
- The objective on function algebra will also include inverse functions in it.
- You will have to factor polynomials.