

Some review for exam 2

Our second exam is on Friday 11/10. The exam will cover everything we have done in class since the last exam up to and including all material on rational functions. The difficulty level of the questions on the exam will be similar to the quiz problems.

To study for the exam you should go over all old quizzes and assignments and make sure you understand how to do each problem. If you run out of questions to do from old quizzes and assignments, you should then do the relevant problems on the old exams which I have posted on the web page. If you still need more practice, there are plenty of exercises in the book which you can do (the sections we have covered are listed on the schedule which is posted on the course web page).

Here is an outline of the topics which will be covered on the exam.

- Square roots.
 - Know what the graph of $s(x) = \sqrt{x}$ looks like and using this graph (along with graph transformations) you should be able to sketch the graph of any function with rule $f(x) = a\sqrt{x - b} + c$.

- Polynomial functions
 - Know how to do long division.
 - Know the relationship between factors and remainders.
 - Know that the remainder when $f(x)$ is divided by $x - c$ is $f(c)$.
 - Know that c is a root of a f exactly when $x - c$ is a factor of $f(x)$.
 - Know how to use long division to solve polynomial equations.
 - Know what graphs of polynomial functions look like (smooth and continuous).
 - Know what the degree, leading coefficient, and constant term of a polynomial tell you about a graph. In fact you should be able to look at a graph of a polynomial function and say whether the degree is even or odd, whether the leading coefficient is positive or negative, the value of the constant term, and the minimal degree.

- Absolute values
 - you should know how to write the rule of $f(x) = |x|$ as a piecewise function.
 - You should know what the graph of the function $A(x) = |x|$ looks like and using this graph (along with graph transformations) you should be able to sketch the graph of any function with rule $f(x) = a|x - b| + c$.
 - Be able to solve absolute value equalities as well as inequalities.

- Piecewise functions

- Understand the notation for the rule of a piecewise function.
- You should be able to look at the rule of a piecewise function f and
 - * list values like $f(3)$ and $f(0)$.
 - * give the domain of f .
 - * sketch its graph and label (with x and y coordinates) all
 - x -intercepts,
 - y -intercepts,
 - holes,
 - endpoints.
 - * use the graph to state the range of f

- Rational functions.

- You should be able to find the rule of f^{-1} given the rule of f where $f(x)$ is something like $\frac{2x-1}{4+7x}$ or $\frac{1+5x^7}{12x^7}$.
- You should be able to use the round trip theorem to determine whether or not two rational functions are inverse to one another.
- You should be able to factor the numerator and denominator of many rational functions.
- Once the numerator and denominator of the rule of a rational function have been factored, you should be able to determine each of the following:
 - * The domain
 - * Any vertical asymptotes (you should write these as $x = a$ where a is some constant)
 - * Any holes (both x and y coordinates).
 - * The horizontal asymptote (written $y = b$ for some constant b .)
 - * Any x -intercepts
 - * Any y -intercepts