LARSON—MATH 353—HOMEWORK WORKSHEET 04
Comparison of Functions.

1. Log in to your Sage Cloud account.
   
   (a) Start the Chrome browser.
   (b) Go to http://cloud.sagemath.com and sign in.
   (c) You should see an existing Project for our class. Click on that.
   (d) Click “New”, call it h04, then click “Sage Worksheet”.

   You are given two functions. Which is bigger? When? Of course we could investigate this analytically (with calculus) but let’s start with some experiments.

2. Use Sage to graph \( f(x) = x - x^2 \) and \( g(x) = -x^2 \log(x) \) on the interval \([0, 1]\). Draw.

3. Use Sage to find the intervals where \( f(x) \) is greater than \( g(x) \) on \([0, 1]\) (there are various things you can do, including calculating lots of values near where it looks like points of intersection).

4. What kind of analysis can you get using calculus?
5. Repeat this experiment. Now use Sage to graph \( h(x) = x^2 - x^4 \) and \( g(x) = -x^2 \log(x) \) on the interval \([0, 1]\). Draw.

6. Use Sage to find the intervals where \( h(x) \) is greater than \( g(x) \) on \([0, 1]\).

7. What kind of analysis can you get using calculus?