LARSON—MATH 255–CLASSROOM WORKSHEET 30
Problems.

1. (a) Start the Chrome browser.
   (b) Go to http://cocalc.com
   (c) Login using **your VCU email address** .
   (d) Click on our class Project.
   (e) Click "New", then "Worksheets", then call it **c30**.
   (f) For each problem number, label it in the Sage cell where the work is. So for Problem 2, the first line of the cell should be #Problem 2.

Problems

2. (**Goldbach**). Goldbach conjectured that ever even number larger than 2 is the sum of two primes. So $= 2 + 2$, $6 = 3 + 3$, $8 = 5 + 3$, etc. Despite much work (with real progress in the last 100 years) the conjecture remains unresolved (open). It is known to be true up to some ginormous n.

   Write a program goldbach(n) that takes an even integer greater than 2 as input and returns two primes p_1 and p_2 so that $n = p_1 + p_2$.

3. $n!$ means $n \times (n-1) \times \ldots \times 3 \times 2 \times 1$. For example, $10! = 10 \times 9 \times \ldots \times 3 \times 2 \times 1 = 3628800$, and the sum of the digits in the number 10! is $3 + 6 + 2 + 8 + 8 + 0 + 0 = 27$. Find the sum of the digits in the number 100! (100-factorial).

4. (**Ramanujan**) 2, 9, 16, etc. can be written (uniquely) as the sum of 2 cubes ($1^3 + 1^3$, $1^3 + 2^3$, $2^3 + 2^3$, etc.). Find the smallest integer which can be written as the sum of 2 cubes in 2 different ways.

Getting your classwork recorded

When you are done, before you leave class...

(a) Click the "Make pdf" (Adobe symbol) icon and make a pdf of this worksheet. (If CoCalc hangs, click the printer icon, then "Open", then print or make a pdf using your browser).

(b) Send me an email with an informative header like "Math 255 - c30 worksheet attached" (so that it will be properly recorded).

(c) Remember to attach today's classroom worksheet!