

LARSON—MATH 255—HOMEWORK WORKSHEET 10
Problems.

1. Log in to CoCalc.
 - (a) Start the Chrome browser.
 - (b) Go to `https://cocalc.com`
 - (c) Login (**your VCU email address** is probably your username).
 - (d) You should see an existing Project for our class. Click on that.
 - (e) Click “New”, then “Sage Worksheet”, then call it **h10**.

Annotate your work carefully and completely. The more explanation the better!.

If you are stuck, get help, talk to your classmates, try things. At worst, your worksheet should include all your dead ends and **attempts**. (You can’t ever succeed unless you **try**).

In class we investigated **Goldbach’s Conjecture** (Goldbach conjectured that every even number larger than 2 is the sum of two primes. So $4 = 2 + 2$, $6 = 3 + 3$, $8 = 3 + 5$, etc.) and wrote 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 $n = p_1 + p_2$.

Problem. It was also proposed by Goldbach that every odd composite number can be written as the sum of a prime and twice a square. So, $9 = 7 + 2 \cdot 1^2$, $15 = 7 + 2 \cdot 2^2$, $21 = 3 + 2 \cdot 3^2$, etc.

It turns out that the conjecture was false. **What** is the smallest odd composite that *cannot* be written as the sum of a prime and twice a square?

Getting your homework recorded

When you are done writing up your nicely annotated code examples...

- (a) Click the Printer-icon button and make a pdf of this worksheet. (If Cocalc hangs, click the *File* button, then Save-and-Download as pdf (via “JupyterLab notebook” is slightly more attractive than the “Classic” option).
- (b) Send me an email with an informative header like “Math 255—h10 worksheet attached” (so that it will be properly recorded).
- (c) Remember to attach your homework worksheet pdf!