

**LARSON—MATH 255—HOMEWORK WORKSHEET h08**  
**Problems!**

1. Create a Cocalc/Sage Cloud account.
  - (a) Start the Chrome browser.
  - (b) Go to `http://cocalc.com`
  - (c) You should see an existing Project for our class. Click on that.
  - (d) Click “New”, then “Sage Worksheet”, then call it **h08**.
  - (e) For each problem number, label it in the SAGE cell where the work is. So for Problem 1, the first line of the cell should be **#Problem 1**.
2. What is the index of the first term in the Fibonacci sequence to contain 1000 digits?
3. Find the smallest sum  $x + y + z$  with integers  $x > y > z > 0$  such that  $x + y$ ,  $x - y$ ,  $x + z$ ,  $x - z$ ,  $y + z$ ,  $y - z$  are all perfect squares.
4. If  $p = 120$  is the perimeter of a right triangle with integer length sides,  $\{a, b, c\}$ , there are exactly three solutions (three triples that are the sides of a right triangle):  $\{20, 48, 52\}$ ,  $\{24, 45, 51\}$ , and  $\{30, 40, 50\}$  (assuming  $a \leq b \leq c$ )..  
Write a function **solutions(p)** that finds the number of right triangles with integer length sides,  $\{a, b, c\}$ , and perimeter  $p$ .
5. For which value of  $p \leq 1000$ , is the number of solutions maximized (for which  $p$  has the most triples that work)?

**Getting your homework 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 - h08 worksheet attached” (so that it will be properly recorded).