

Last name \_\_\_\_\_

First name \_\_\_\_\_

**LARSON—MATH 353—CLASSROOM WORKSHEET 02**  
**Getting Started.**

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 “Worksheets”, then call it **c02**.

2. **A problem to think about: the Birthday Problem.** If there’s 366 students in a room some pair of them are guaranteed to have the same birthday (month & day) . If there are only 2 students in a room they are very unlikely to have the same birthday. How many students do we need in order for the probability to be at least  $\frac{1}{2}$  that at least one pair of students has the same birthday?

The multiplication operator in Sage is “\*”. The most common error in Sage is forgetting to put in a “\*” when multiplying.

3. Find  $550 \frac{[1 + (1.05)^{-30}]}{0.05}$

4. Use  $n(\_)$  to find a decimal approximation for  $\sqrt{8}$ .

The `sqrt` command can be modified to find other roots. Evaluate `help(sqrt)` to get useful *help* information for this command.

5. Find  $\sqrt[6]{50}$ .

6. Evaluate “pi”. Then use  $n(\_)$  to find a decimal approximation for  $\pi$ .

7. Evaluate “e”. Find a 6-digit approximation for  $e$

8. Find a 6-digit approximation for  $e^3$
9. Find  $\log 10$
10. Find  $\log_{10} 10$ .
11. Find  $\sin \frac{\pi}{3}$
12. Find  $\tan \frac{\pi}{2}$ .
13. Find  $\arcsin \frac{1}{2}$

Sage doesn't understand degrees—only radians. What can you do here?

14. Find  $\sin 47^\circ$ , and a decimal approximation.
15. Type in “i” and evaluate.
16. Find  $i^3$  by hand, then check it with Sage.

`plot` is Sage's powerful and flexible command for plotting functions of a single variable.

17. Sketch the graph of  $x^3$  on the interval  $(-2, 2)$ .
18. Sketch the graph of  $|x - 1|$  on a “nice” interval.
19. Sketch  $\cos x$ .
20. Sketch  $\cos t$ . What happens? What do you think the difference is?

### 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 353 - c02 worksheet attached” (so that it will be properly recorded).
- (c) Remember to attach today's classroom worksheet!