

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

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

**LARSON—MATH 353—CLASSROOM WORKSHEET 01**  
**Getting Started.**

1. Create a CoCalc account.

- (a) Start the Chrome browser.
- (b) Go to <https://cocalc.com>
- (c) “Create new account” using **your VCU email address** .
- (d) You should see an existing Project for our class. Click on that.
- (e) Click “New”, then “Jupyter Notebook”, then call it **c01**.
- (f) Make sure you have SAGE as the *kernel*.

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

2. Find  $900(1 + .06(90/365))$ .

3. Find  $25^2$  and  $25^{10}$ .

Sage uses only curved parentheses for grouping. The common square parentheses are reserved in Sage for *lists*.

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

Sage returns *exact expressions* (no rounding error) when possible.

5. Find an exact expression for  $\sqrt{8}$ .

You often have to *force* Sage to give you a decimal approximation of what you’ve calculated.

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

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

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

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

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

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

16. Find  $\sin 47^\circ$ , and a decimal approximation.
17. Type in “i” and evaluate.
18. 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.

19. Sketch the graph of  $x^3$  on the interval  $(-2, 2)$ .
20. Sketch the graph of  $|x - 1|$  on a “nice” interval.
21. Sketch  $\cos x$ .
22. 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 “Print” menu choice (under “File”) and make a pdf of this worksheet.
- (b) Send me an email ([clarson@vcu.edu](mailto:clarson@vcu.edu)) with an informative header like “Math 353 - c01 worksheet attached” (so that it will be properly recorded).
- (c) Remember to attach today's classroom worksheet!