

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

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

**LARSON—MATH 255—CLASSROOM WORKSHEET 02**  
**Getting Started.**

1. Create a Cocalc/Sage Cloud account.
  - (a) Start the Chrome browser.
  - (b) Go to `http://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 “Sage Worksheet”, then call it **c02**.
  - (f) 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**.

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  $25^2$  by evaluating `25**2`. Find  $25^{10}$ .

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

4. Find  $550 \frac{[1 + (1.05)^{-30}]}{0.05}$ . What happened? How can you fix it?

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

5. Find an exact expression for  $\sqrt{8}$  by evaluating `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 underscore refers to the last computation).
7. What can you do for other roots besides `sqrt`? Find  $\sqrt[6]{50}$ .
8. Find  $\sqrt{-4}$ .
9. Find *both* square roots of  $-10$ .
10. Find  $i^2$ .
11. Evaluate “pi”. Then use `n(_)` to find a decimal approximation for  $\pi$ .

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

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

20. Find  $\sin 47^\circ$ , and a decimal approximation.
21. Type in “i” and evaluate.
22. 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.

23. Sketch the graph of  $x^3$  on the interval  $(-2, 2)$ .
24. Sketch the graph of  $|x - 1|$  on a “nice” interval.
25. Sketch  $\cos x$ .
26. Sketch  $\cos t$ . What happens? What do you think the difference is?
27. Sketch  $\cos x$  on the interval  $(-2\pi, 2\pi)$ .
28. Sketch  $x^3 - x$  with  $y$ -range between  $y = -6$  and  $y = 6$ .

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