**Last name** _____

**First name** _____

**LARSON—MATH 255–CLASSROOM WORKSHEET 01**
**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 *mymail* email address** .

   (d) You should see an existing Project for our class. Click on that.

   (e) Click "New", then "Worksheets", then call it **c01**.

   (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 $550\dfrac{[1 + (1.05)^{-30}]}{0.05}$. 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 $\sin 47°$, 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 $y = 6$.

29. Sketch $x^3 - x$ on the interval $(-3, 3)$ and $y$-range between $y = -6$ and $y = 6$.