Working in a group of 2–3 people, complete 2 of the following problems. After 50 minutes have elapsed, submit your solutions to your workshop instructors. You should be able to do the other problems—use them for practice!

Your group’s work will be graded on correctness, but more of your grade will depend on communication. Consider workshops as practice for your written assignments. Writing legibly (including well-labelled graphs), using complete sentences, and fully explaining your thoughts in a logical order will earn high marks.

Reminder: The linear approximation to \( f(x) \) at \( x = a \) is

\[
f(x) \approx f(a) + f'(a)(x - a)
\]

1. Find the linear approximation of each function at the indicated point. Draw a rough sketch of what the function and the linear approximation looks like.
   - (a) \( f(x) = \sin x \) at \( x = \pi/6 \).
   - (b) \( g(x) = \log x \) at \( x = e \).

2. Use a linear approximation of each function to estimate the value indicated. Identify the \( x \) coordinate of your linear approximation. Draw a rough sketch of what the function and the linear approximation looks like.
   - (a) \( h(x) = \sin x + \cos x \). Estimate \( h(-0.1) \).
   - (b) \( k(x) = \log x \). Estimate \( k(0.98) \).

3. Estimate the area of a disk if the radius is known to be 30 cm with 0.01 cm error.

4. (Covered in Thursday’s class) Use a quadratic approximation of \( f(x) = 2 \arcsin(x) \) about \( x = 0 \) to approximate \( f(1) \). What number are you approximating?

5. (Covered in Thursday’s class) Give the 9th degree Maclaurin polynomial for \( f(x) = \sin(x) + \cos(x) \).

After you finish these problems, please submit your work to your workshop instructors. In the remaining 30 minutes of workshop, make the most of the available time and help.