Working in a group of 2–3 people, complete at least 1 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.

1. The total amount of drag (drag and induced drag) experienced by an aircraft flying at velocity $v$ is

$$D(v) = Av^2 + \frac{B}{v^2},$$

where $A$ and $B$ are positive parameters related physical quantities. Find the domain of $D(v)$, the $v$-intercepts, the horizontal and vertical asymptotes (if any), identify minima and maxima by finding the intervals of increase and decrease, and sketch the graph.

2. Sketch the graph of $f(x) = x^{8/3} - 4x^{2/3}$. Find the domain of $f(x)$, the $x$ intercepts, identify minima and maxima by finding the intervals of increase and decrease. Sketch the graph of the function.

3. (Covered in class on Thursday) Use symmetry to sketch graphs of the functions

   (a) $f(x) = \frac{x^2 - 9}{x^2 + 3}$

   (b) $g(x) = \frac{x}{x^2 - 9}$

4. (Covered in class on Thursday) Use L’Hôpital’s Rule to evaluate the following limits. Describe the indeterminate form encountered in each case.

   (a) 
   $$\lim_{x \to \pi} \frac{\sin x}{x - \pi}$$

   (b) 
   $$\lim_{x \to 0} \frac{x^2}{1 - \cos x}$$

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.