Review Problems for Final

1. Graph $f(x) = \frac{x^2+4x+3}{x-2}$.
2. Graph $f(x) = \frac{1}{x} + \sqrt{x}$.
3. Graph $f(x) = \sqrt{x^2 - 2}$.
4. Find a constant k such that $\lim_{x\to 0} \frac{\sin(x)+kx}{x^3}$ exists.
5. Use Newton's Method to fin the next two terms for
   - $x^2 - x - 1 = 0$, $x_0 = 1$
   - $ax - b = 0$, $x_0 = c$
6. A 10m wire is cut into two pieces, one bent to make a square and the other an equilateral triangle. Maimize/minimize the combined area of the two shapes.
7. Maximize/minimize $g(x) = \int_{\sin(x)}^{\cos(x)} t\,dt$
8. Write the Riemann sums for the areas of triangles with the following vertices, and find the corresponding integrals:
   - $(0,0), (1,0), (1,1)$
   - $(1,0), (2,0), (2,1)$
   - $(0,0), (1/2,0), (1/2,2)$
9. Find the volume of the region bounded by $y = 1 - x^2$ and $y = 0$, rotated around...
   - $x = 1$
   - $y = 1$
10. Prove that e^x and e^{-x} intersect exactly once.
11. Find the volume of a pyramid with height 1 and a square base of side length 1.