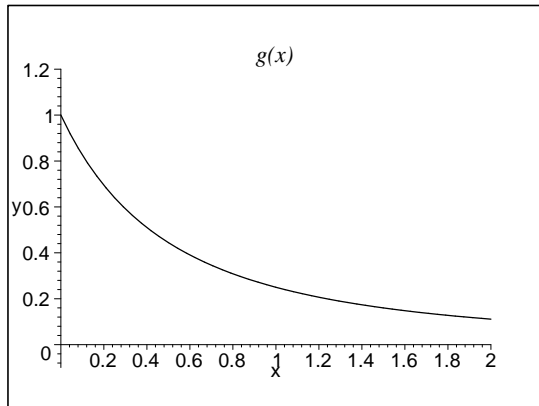


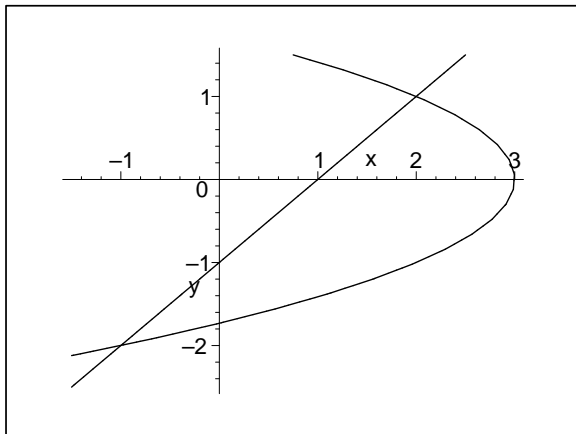
MATH 119 PRACTICE FIRST MIDTERM

The actual midterm will of course be shorter than this. You may use a calculator, but not any of its calculus functions. Don't expect too many "compute the integral" problems; that material is covered by the online Integral Proficiency Test.

- Chapter 6 Review (p. 306): #51, 55, 69. Chapter 7 Review (p. 361): #1-132 as needed, 161. Section 8.1 (p. 374): #26.
- The left, right, trapezoid, and midpoint rules were used to estimate $\int_0^2 g(x) dx$, where g is the function whose graph is shown. The estimates were 0.7811, 0.8632, 0.8675, and 0.9540, and the same number of subintervals were used in each case.



- Which rule produced which estimate? Explain.
 - Between which two estimates does the true value of $\int_0^2 g(x) dx$ lie?
- Compute $\frac{d}{dx} \left(\int_x^1 \ln t dt \right)$.
 - Find the area of the region bounded by the graphs of $x = 3 - y^2$ and $x = y + 1$. (The graphs intersect at the points $(-1, -2)$ and $(2, 1)$, as shown in the figure.)



- For what type of integrand do the Left Sum and Right Sum approximations give the exact value for the integral on any interval? For what type of integrand do the Trapezoid and Midpoint approximations give the exact value for the integral on any interval?

6. Assuming that the 440 feet is accurate and you neglect air resistance, determine the accuracy of the following paragraph. (A mile is 5280 feet.)

MY JOURNEY BENEATH THE EARTH

Condensed from "A Wolverine is Eating My Leg," by Tim Cahill

I am in Ellison's Cave, about to rappel down Incredible Pit, the second-deepest cave pit in the continental United States. The drop is 440 feet, about what you'd experience from the top of a 40-story building. If you took the shaft in a free fall, you'd accelerate to more than 100 miles an hour and then – about five seconds into the experience – you'd decelerate to zero. And die.