

A Practice Midterm I¹

- (15 points) A plane flies at 200 mph for the first and last half hour of a flight. It flies at a higher constant speed for the rest of the flight. The route is 1950 miles. The plane is 850 miles from the destination 2 hours before the end of the flight. How many hours is the entire flight?
- (20 points) A swimming pool contains x (less than 0.02) grams of chlorine per cubic meter. The pool measures 5 meters by 50 meters and is 2 meters deep. Some water will be drained and replaced by water containing 3 grams of chlorine per cubic meter. How much water should be drained so the pool ends up with 0.02 grams of chlorine per cubic meter. (Your answer should be an expression in x .)
- (15 points) Evaluate the following integrals
 - $\int_0^a (ax - 3)^2 dx$ (a is a constant)
 - $\int_0^4 \sqrt{x} dx$
 - $\int \frac{2+x^2}{x^2} dx$
- (20 points) A full tank initially (at $t = 0$) contains 16 gallons. Then water is removed at a rate of $1 + t$ gallons per minute where t is the time in minutes.
 - (10 points) How much water remains in the tank after t minutes?
 - (10 points) When is the tank half empty?
- (30 points) The graph shows the velocity of car during 4 hours. (Include units in your answers.)
 - (10 points) How far did car go in the 4 hours?
 - (10 points) What was the average velocity?
 - (10 points) What was the acceleration after one hour?

¹<http://www.math.ucsb.edu/~xichen/math34b02w/p1.pdf>

