

1. Consider dogs (treat them as points) at the corners of a square of side length 2 dam^1 centered at the origin. The dog starting at $(1, 1)$ always moves toward the dog starting at $(-1, 1)$. The dog starting at $(-1, 1)$ always moves toward the dog starting at $(-1, -1)$. Similarly for the other two dogs. The dogs spiral in a counterclockwise direction at a constant speed until they meet at the origin.
 - (a) Find polar equations for the four dog paths. Note, you will need to know the solution to the differential equation $r' = -r$ is given by $r = Ce^{-\theta}$. You will also need the polar slope equation developed in class on Thursday.
 - (b) Find the distance each dog runs before they meet at the origin.
 - (c) Assuming they run at a constant speed of 4 m/s , how long does it take for them to meet at the origin?
 - (d) How dizzy are they?

Random Thoughts on the final.

I expect the final will be roughly composed of the following - 100 points total.

1. 40-50 points - Chapter 11. Everything is fair. Expect polar curve sketching, polar areas, arc lengths, various parametric questions.
2. 20-30 points - Chapter 7. Integration by Parts, Trig Integrals, Trig Substitution, and Partial Fractions are all reasonable. Improper integrals are also reasonable.
3. 10ish points - Chapter 6. Applications of integration. I will ask a work question. I will not ask anything else from Chapter 6 or 8.
4. 10-30 points - Geometric and Power Series. Geometric Series are important. The Root and Ratio Test are important, as is the material regarding power series in general, and Taylor series in particular.
5. 10ish points - reasonable interesting questions.

Sections in the text to review: 5.7, 5.8, 6.5, 7.1-3, 7.5-7, 10.2, 10.5-10.7, Chapter 11.

Given Information: See the given information for the second and third exams - available on the webpage.

More information will be available next week. Hopefully this will give you a start.

¹dam = dekameter = 10 meters