

Name: _____

Test Prep — 10.3 / 15.3 — Math 126

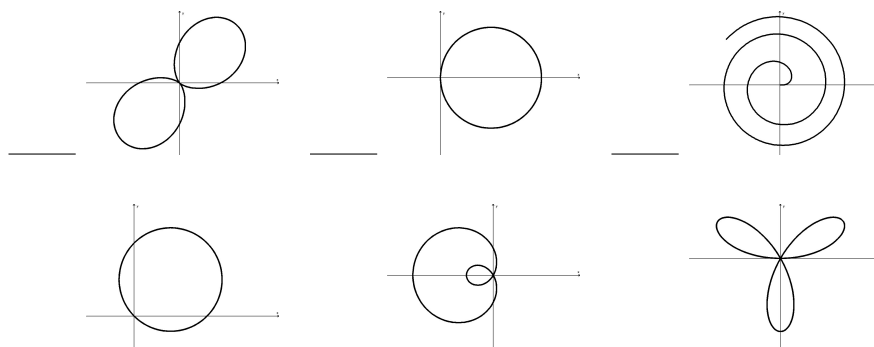
Participation:

- +1: show written work from 10.3 / 15.3 homework
- +1: participate in this test prep

Page 1 — Polar Graphs (10.3)

1. **Spring 2013 - Exam 1:** In the blanks provided to the left of each graph, put the number of the polar equation that matches the graph in the xy -plane (two graphs will not be labeled).

1. $r = \sqrt{\theta}$ 2. $r = 1 - 2 \cos(\theta)$ 3. $r = 1 + \sin(2\theta)$ 4. $r = 9 \cos(\theta)$



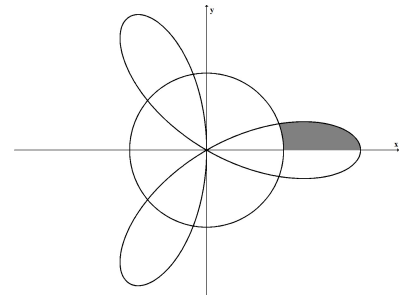
Hint: For each equation, plug in key angles $\theta = 0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}$ and see what points you get. This is often enough to recognize the graph.

2. **Trig review / homework helper:** Find the first several values of θ at which the polar curve $r = 2 \cos(3\theta)$ passes through the origin. (*Note: this curve looks like a “rose” — you are finding when each loop starts and ends.*)

Page 2 — Double Integrals in Polar Coordinates (15.3)

These are the types of problems you will see on exams. It is a very good idea to start working on 15.3 early — this is a major section. It is okay if you don't know how to do these yet, just move onto homework, but by early next week you want to have a plan for such problems.

1. **Winter 2024 - Exam 2:** Find the area of the region shown which is between $x^2 + y^2 = 1$, $r = 2 \cos(3\theta)$ and above the x -axis. Note this means the integral is $\iint_D 1 \, dA$. Your job is to set it up in polar.



2. **Spring 2019 - Exam 2:** Set up and evaluate $\iint_D \sqrt{x^2 + y^2} \, dA$ where D is the region in the first quadrant that lies between the circles $x^2 + y^2 = 4$ and $x^2 + y^2 = 4x$.

