

Homework #19Due **MONDAY, December 8th** in Gradescope by 11:59 pm ET

Goal: Exploring Polar Coordinates and their relation to Cartesian Coordinates, and Sketching Polar Curves.

For 1-3, Plot the point with the given Polar coordinates. Label everything. Then find the Cartesian coordinates of the point.

$$1. (r, \theta) = \left(2, \frac{3\pi}{2}\right) \quad 2. (r, \theta) = \left(\sqrt{2}, \frac{\pi}{4}\right) \quad 3. (r, \theta) = \left(-1, -\frac{\pi}{6}\right)$$

For 4-5, Plot the point of the given Cartesian coordinates. Label everything.

First, find Polar coordinates (r, θ) of the point, where $r > 0$. Keep $0 \leq \theta < 2\pi$.

Second, find Polar coordinates (r, θ) of the point, where $r < 0$. Keep $0 \leq \theta < 2\pi$.

$$4. (x, y) = (-4, 4) \quad 5. (x, y) = (3, 3\sqrt{3})$$

For 6-11, Carefully sketch each of the following Polar curves. **Show all work. Also show both the Cartesian Plot and the final Polar plot. Label everything.**

$$6. r = 2 \cos \theta \quad 7. r = 3 \sin \theta$$

$$8. r = 1 + \sin \theta \quad 9. r = 2 + 2 \cos \theta \quad 10. r = 3 - 3 \sin \theta$$

$$11. \text{ NEW! Try it! Flower-petal-leaved rose } r = 2 \sin(2\theta)$$

REVIEW: Compute the following Integrals.

$$12. \int \frac{x^3}{(x^2 + 4)^{\frac{7}{2}}} dx \quad 13. \int \frac{1}{(x^2 + 4)^2} dx$$

$$14. \int_0^e \frac{\ln x}{\sqrt{x}} dx \quad 15. \int_0^{e^3} \frac{1}{x[9 + (\ln x)^2]} dx$$

IMPORTANT NOTE! You will be receiving an e-mail from the math department to fill out a course/teaching evaluation. These are really important to me, the course and the College, so I will appreciate it if you take the time to fully fill them out. Thanks so much!

REGULAR OFFICE HOURS

Monday: 12:00–3:00 pm

6–9:00pm TAs Emma/Myles, SMUDD 204

Tuesday: 1:00–4:00 pm

5:30–7:00 pm TA Julia, SMUDD 204

7:30-9:00 pm TA Emma, SMUDD 204

Wednesday: 1:00-3:00 pm

6–10:30 pm TAs Julia/Myles/Natalie, SMUDD 204

Thursday: none for Professor

extras may be added, TBD weekly

7:30–10:30 pm TAs Natalie/DJ, SMUDD 204

Friday: 12:00–2:00 pm

7:30–9:00 pm TA DJ, SMUDD 204

Keep reading your notes every night...