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Graph And Find Area Of Polar Equations Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the formula to convert a point from polar coordinates (r, θ) to Cartesian coordinates?

undefined. A) x = r sin(θ), y = r cos(θ)

undefined. B) x = r cos(θ), y = r sin(θ) ✓

undefined. C) x = r tan(θ), y = r cot(θ)

undefined. D) x = r sec(θ), y = r csc(θ)

The correct formula is x = r cos(θ), y = r sin(θ).

Which of the following are true about polar coordinates?

undefined. A) The origin is represented as (0, θ) for any θ. ✓

undefined. B) The angle θ is measured from the positive x-axis. ✓

undefined. C) Polar coordinates can only represent points in the first quadrant.

undefined. D) r can be negative, indicating the point is in the opposite direction of θ. ✓

The true statements are A, B, and D.

Explain the relationship between polar and Cartesian coordinates. How do they differ in representing points on a plane?

Polar coordinates use a radius and angle, while Cartesian coordinates use x and y values.

Part 2: Understanding and Interpretation

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Which of the following polar equations represents a circle?

undefined. A) r = 2 + 3cos(θ)

undefined. B) r = 4 ✓

undefined. C) r = 3sin(2θ)

undefined. D) r = θ

The equation r = 4 represents a circle with radius 4.

Identify the symmetries present in the polar equation r = 5cos(θ).

undefined. A) Symmetry about the polar axis ✓

undefined. B) Symmetry about the line θ = π/2

undefined. C) Symmetry about the pole ✓

undefined. D) No symmetry

The equation has symmetry about the polar axis and the pole.

Describe how you would determine the symmetry of a polar graph. What tests would you perform?

To determine symmetry, check if the equation remains unchanged under specific transformations.

Part 3: Application and Analysis

If a polar equation is given by r = 3 + 2sin(θ), what is the maximum value of r?

undefined. A) 2

undefined. B) 3

undefined. C) 5 ✓

undefined. D) 1

The maximum value of r is 5 when sin(θ) is at its maximum.

Consider the polar equation r = 2sin(θ). Which of the following are true about its graph?

undefined. A) It is a circle. ✓

undefined. B) It is symmetric about the line θ = π/2. ✓

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undefined. C) The maximum radius is 2. ✓

undefined. D) It passes through the origin.

The graph is a circle, symmetric about the line θ = π/2, with a maximum radius of 2.

Given the polar equation r = 4cos(3θ), determine the number of petals in the graph and explain your reasoning.

The graph has 6 petals because the coefficient of θ is 3, which indicates 2n petals for n being odd.

Which integral would you use to find the area enclosed by one petal of the polar equation r = 3cos(2θ)?

undefined. A) 1/2∫ from 0 to π (3cos(2θ))^2 dθ

undefined. B) 1/2 ∫ from 0 to π/2 (3cos(2θ))^2 dθ ✓

undefined. C) 1/2∫ from 0 to π/4 (3cos(2θ))^2 dθ

undefined. D) 1/2∫ from 0 to π/3 (3cos(2θ))^2 dθ

The correct integral is 1/2∫ from 0 to π/2 of (3cos(2θ))^2 dθ.

Part 4: Evaluation and Creation

Evaluate the accuracy of the following statement: "The area enclosed by the polar curve r = 2sin(θ) from θ = 0 to θ = π is π." Is this statement:

undefined. A) True ✓

undefined. B) False

undefined. C) Uncertain

undefined. D) Not applicable

The statement is true; the area is indeed π.

Create a polar equation that represents a rose curve with 6 petals. Which of the following equations would work?

undefined. A) r = 4cos(3θ)

undefined. B) r = 2sin(3θ)

undefined. C) r = 5cos(6θ) ✓

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undefined. D) r = 3sin(6θ) ✓

The equations r = 5cos(6θ) and r = 3sin(6θ) both represent rose curves with 6 petals.

Design a real-world scenario where polar coordinates would be more advantageous than Cartesian coordinates. Explain why polar coordinates are preferable in this context.

Polar coordinates are preferable in scenarios like navigation or radar, where direction and distance are key.

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