



Calculus 2 Workbook

Polar curves

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MATH

POLAR COORDINATES

- 1. Convert the rectangular point $(2, -2)$ to a polar point.
- 2. Convert the polar point $(3, \pi/4)$ to a rectangular point.
- 3. Convert the rectangular point $(-5\sqrt{3}, 5)$ to a polar point.
- 4. Convert the polar point $(8, 11\pi/6)$ to a rectangular point.



CONVERTING RECTANGULAR EQUATIONS

- 1. Convert the rectangular equation to an equivalent polar equation.

$$4x^2 + 4y^2 = 64$$

- 2. Convert the rectangular equation to an equivalent polar equation.

$$\frac{x^2}{9} + \frac{y^2}{4} = 1$$

- 3. Convert the rectangular equation to an equivalent polar equation.

$$(x - 2)^2 + (y + 2)^2 = 8$$

- 4. Convert the rectangular equation to an equivalent polar equation.

$$\frac{x^2}{9} - \frac{y^2}{8} = 1$$



CONVERTING POLAR EQUATIONS

- 1. Convert the polar equation to an equivalent rectangular equation.

$$r = 4 \cos \theta + 4 \sin \theta$$

- 2. Convert the polar equation to an equivalent rectangular equation.

$$r = 12 \cos \theta - 12 \sin \theta$$

- 3. Convert the polar equation to an equivalent rectangular equation.

$$r = 3 \sin \left(\theta + \frac{\pi}{4} \right)$$

- 4. Convert the polar equation to an equivalent rectangular equation.

$$r = 6 \cos \theta - 10 \sin \theta$$

- 5. Convert the polar equation to an equivalent rectangular equation.

$$r = 12 \sin \theta$$



DISTANCE BETWEEN POLAR POINTS

- 1. Calculate the distance between the polar coordinate points.

$$\left(2, \frac{\pi}{3}\right) \text{ and } \left(2, \frac{11\pi}{6}\right)$$

- 2. Calculate the distance between the polar coordinate points.

$$\left(4, \frac{7\pi}{12}\right) \text{ and } \left(2, \frac{\pi}{12}\right)$$

- 3. Calculate the distance between the polar coordinate points.

$$\left(4, \frac{\pi}{4}\right) \text{ and } \left(9, \frac{3\pi}{4}\right)$$



SKETCHING POLAR CURVES

- 1. Graph the polar curve. How many petals does the curve have, and what is the length of each petal?

$$r = 5 \sin(4\theta)$$



