

Watch. Practice. Understand. | Lesson 199

Pre Calculus Section 8 1 Polar Coordinate and Its Basic Graph

Watch the matching video: <https://www.youtube.com/watch?v=gfnsCgEfCgE>

Practice focus: Polar coordinates and graphs

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Convert polar $(4, \pi/6)$ to rectangular coordinates.

02 Convert rectangular $(-3, 3)$ to polar form with $r > 0$ and $0 \leq \theta < 2\pi$.

03 Convert $r = 4\cos \theta$ to a rectangular equation and identify the graph.

04 For $r = 2\sin 3\theta$, find the number and length of petals.

Worked answers | Lesson 199

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01 Convert polar $(4, \pi/6)$ to rectangular coordinates.

$$x = r \cos \theta = 2\sqrt{3}; y = r \sin \theta = 2. \text{ Point: } (2\sqrt{3}, 2).$$

02 Convert rectangular $(-3, 3)$ to polar form with $r > 0$ and $0 \leq \theta < 2\pi$.

$$r = \sqrt{18} = 3\sqrt{2}; \text{ quadrant II gives } \theta = 3\pi/4.$$

03 Convert $r = 4\cos \theta$ to a rectangular equation and identify the graph.

$$\text{Multiply by } r: r^2 = 4r \cos \theta, \text{ so } x^2 + y^2 = 4x. \text{ Circle: } (x - 2)^2 + y^2 = 4.$$

04 For $r = 2\sin 3\theta$, find the number and length of petals.

For odd integer 3, there are 3 petals. Maximum $|r| = 2$, so each petal length is 2.