

Polar Coordinates Review 1

1. Change to rectangular coordinates:

a) $(6, 135^\circ)$

b) $(0, \pi)$

2. Change to polar coordinates:

a) $(-2, 2\sqrt{3})$

b) $(0, -2)$

3. Write the following in rectangular coordinates:

a) $r = 3$

b) $r \sin \theta = 4$

4. Write the following in polar coordinates:

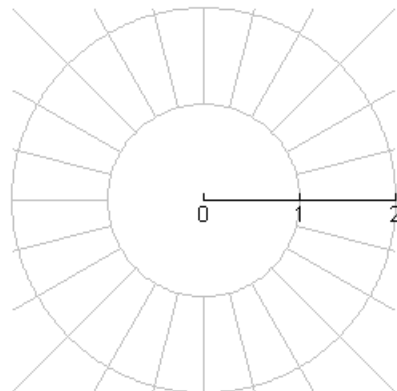
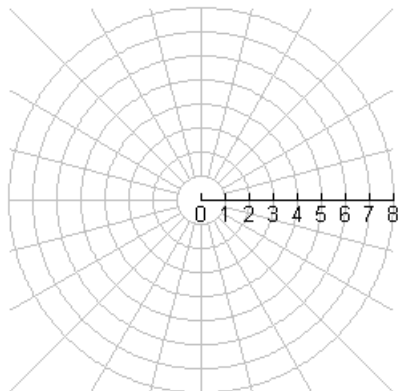
a) $x = 7$

b) $x^2 + y^2 - 6y = 0$

5. Sketch the following curves in polar coordinates:

a) $r = 4 - 4 \cos \theta$

b) $r = \sin 3\theta$



6. Write each complex number in polar form:

a) $1+i\sqrt{3}$

b) -7

7. Write $8cis230^\circ$ in rectangular form:

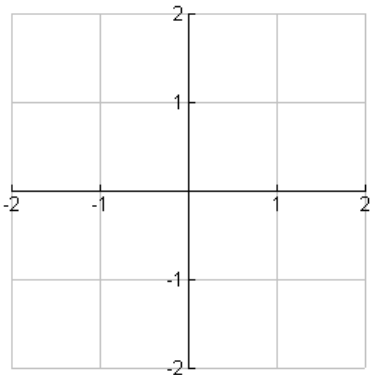
8. Find the product of: $\left(4cis\frac{\pi}{4}\right)\left(3cis\frac{\pi}{2}\right)$.

9. If $z = 1+i\sqrt{3}$, show that $z^{18} = 2^{18}$.

10. Find the three cube roots of -1 .

11. Graph the following parametric equations:

$$x = \cos t, y = \sin 2t \text{ for } 0 \leq t \leq 2\pi.$$



Polar Coordinates Review 1: KEY

1. a) $(-3\sqrt{2}, 3\sqrt{2})$ b) $(0, 0)$

6. a) $2 \operatorname{cis} 60^\circ$ b) $7 \operatorname{cis} 180^\circ$

2. a) $(4, 120^\circ)$ or $(4, \frac{2\pi}{3})$

7. $-5.14 - 6.13i$

b) $(2, 270^\circ)$ or $(2, \frac{3\pi}{2})$

8. $12 \operatorname{cis} (\frac{3\pi}{4})$

3. a) $x^2 + y^2 = 9$

b) $y = 4$

9.

$$z = 2 \operatorname{cis} 60^\circ$$

$$z^{18} = 2^{18} \operatorname{cis} (1080^\circ)$$

$$z^{18} = 2^{18} (1) + 2^{18} (0)i$$

$$z^{18} = 2^{18}$$

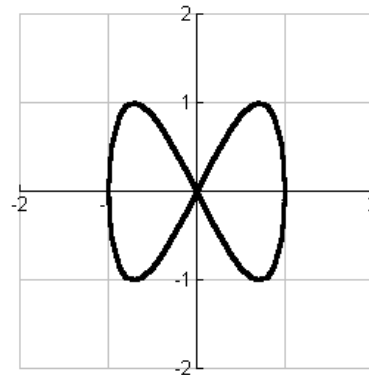
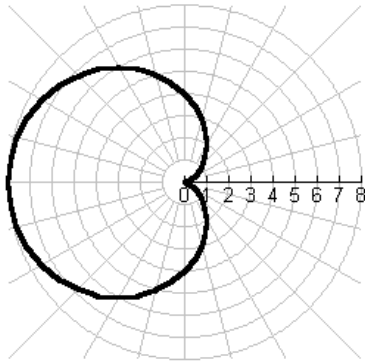
4. a) $r = \frac{7}{\cos \theta}$

b) $r = 6 \sin \theta$

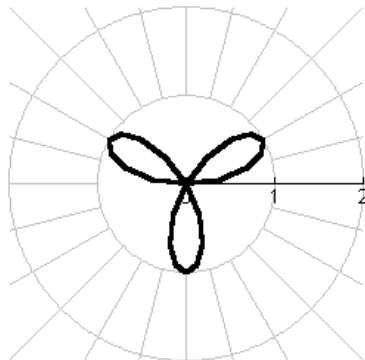
$$z = \frac{1}{2} + \frac{\sqrt{3}}{2}i$$

10. $z = -1$

$$z = \frac{1}{2} - \frac{\sqrt{3}}{2}i$$



5. a)



11.

b)