Student: Cole Lamers **Date:** 07/27/19	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** 7.6 Polar Coordinates

1. Complete the sentence below.

   The polar coordinates (r,θ) of a point are the directed distance r to the _____ and the directed angle θ from the polar _____.

   The polar coordinates (r,θ) of a point are the directed distance r to the origin and the directed angle θ from the polar axis.

2. Select the correct choice that completes the sentence below.

   The positive value of r corresponds to a distance r on the terminal side of θ, and a negative value corresponds to a distance $|r|$ in the opposite direction.

3. Complete the sentence below.

   The substitutions x = _____ and y = _____ transform a rectangular equation into a polar equation for the same curve.

   The substitutions x = $r\cos\theta$ and y = $r\sin\theta$ transform a rectangular equation into a polar equation for the same curve.

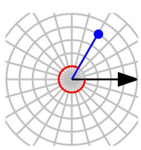
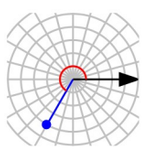
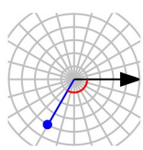
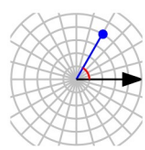
4. Complete the sentence below.

   Polar coordinates are found from the rectangular coordinates by the formulas r = $\sqrt{x^2+y^2}$ and $\theta = \tan^{-1}\left(\frac{y}{x}\right)$ in the correct quadrant.

5. Plot the point having the polar coordinates $(4,60^\circ)$. Then find different polar coordinates (r,θ) for the same point for which **(a)** $r<0$ and $0^\circ \le \theta < 360^\circ$, **(b)** $r<0$ and $-360^\circ < \theta < 0^\circ$, **(c)** $r>0$ and $-360^\circ < \theta < 0^\circ$.

   Plot the point having the polar coordinates $(4,60^\circ)$. Choose the correct graph below.

   ○ **A.** ○ **B.** ○ **C.** ✓ **D.**

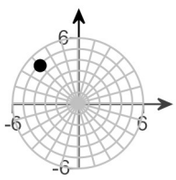
   (a) The polar coordinates for the point $(4,60^\circ)$ for which $r<0$ and $0^\circ \le \theta < 360^\circ$ is $(-4,240)$.
   (Type an ordered pair. Do not include the degree symbol in your answer. Type the coordinate for θ in degrees.)

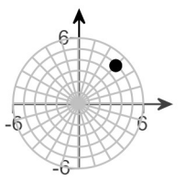
   (b) The polar coordinates for the point $(4,60^\circ)$ for which $r<0$ and $-360^\circ < \theta < 0^\circ$ is $(-4,-120)$.
   (Type an ordered pair. Do not include the degree symbol in your answer. Type the coordinate for θ in degrees.)

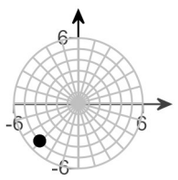
   (c) The polar coordinates for the point $(4,60^\circ)$ for which $r>0$ and $-360^\circ < \theta < 0^\circ$ is $(4,-300)$.
   (Type an ordered pair. Do not include the degree symbol in your answer. Type the coordinate for θ in degrees.)

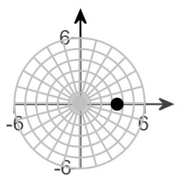
6. Plot the point having the polar coordinates $\left(-5, \frac{\pi}{4}\right)$. Then give two different pairs of polar coordinates of the same point, **(a)** one with the given value of r and **(b)** one with r having the opposite sign of the given value of r.

Select the graph that represents the point $\left(-5, \frac{\pi}{4}\right)$.

A. 

B. 

C. 

D. 

a) Find another pair of polar coordinates of the same point, with the given value of r. Choose the correct answer below.

A. $\left(-5, -\frac{5\pi}{4}\right)$

B. $\left(-5, -\frac{13\pi}{6}\right)$

C. $\left(-5, -\frac{7\pi}{4}\right)$

b) Find another pair of polar coordinates of the same point, with r having the opposite sign of the given value of r. Choose the correct answer below.

A. $\left(5, \frac{5\pi}{4}\right)$

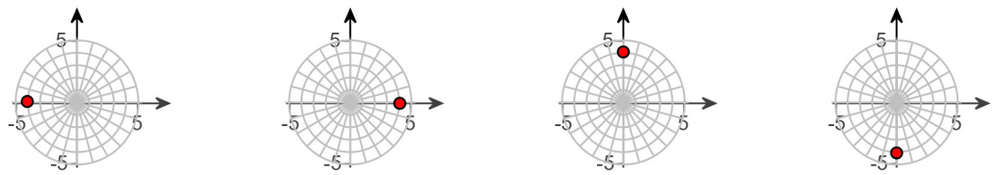
B. $\left(5, -\frac{13\pi}{6}\right)$

C. $\left(5, -\frac{7\pi}{4}\right)$

7. Plot the point having the polar coordinates $\left(4, \frac{3\pi}{2}\right)$. Then give two different pairs of polar coordinates of the same point, **(a)** one with the given value of r and **(b)** one with r having the opposite sign of the given value of r.

Select the graph that represents the point $\left(4, \frac{3\pi}{2}\right)$.

A. **B.** **C.** **D.**



a) Find another pair of polar coordinates of the same point, with the given value of r. Choose the correct answer below.

A. $\left(4, -\frac{\pi}{2}\right)$

B. $\left(4, \frac{13\pi}{5}\right)$

C. $\left(4, \frac{\pi}{2}\right)$

b) Find another pair of polar coordinates of the same point, with r having the opposite sign of the given value of r. Choose the correct answer below.

A. $\left(-4, \frac{13\pi}{5}\right)$

B. $\left(-4, -\frac{\pi}{2}\right)$

C. $\left(-4, \frac{\pi}{2}\right)$

8. Find the rectangular coordinates of the point given in polar coordinates.

$(8, 120^\circ)$

The rectangular coordinates are $(-4, 4\sqrt{3})$.

(Simplify your answer. Type an ordered pair. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression.)

9. The rectangular coordinates of a point are given. Find polar coordinates of the point such that $r > 0$ and $0 \le \theta < 2\pi$.

$(-6, 6)$

The polar coordinates are $\left(6\sqrt{2}, \frac{3\pi}{4}\right)$

(Simplify your answer, including any radicals. Type an ordered pair. Type an exact answer, using π as needed. Use integers or fractions for any numbers in the expression.)

10. Convert to a polar equation.

$x^2 + y^2 = 9$

Which of the following is the correct polar equation?

A. $r = 3$

B. $3 \cos \theta - 3 \sin \theta = 0$

C. $9 \cos \theta - 9 \sin \theta = 0$

D. $r = 9$

11. Convert the following rectangular equation to polar form.

$y^2 = 6y - x^2$

The polar form of the rectangular equation is $r = 6 \sin \theta$.

(Simplify your answer. Type an exact answer.)

12. Convert the following polar equation to rectangular form. Identify the curve.

$r = 5$

The rectangular form of the polar equation is $x^2 + y^2 = 25$.
(Type your answer in standard form.)

Identify the curve. Select the correct choice below and fill in the answer box to complete your choice.

- **A.** A line with slope _____ whose y-intercept is the ordered pair _____.
- **B.** A circle whose center is the ordered pair (0,0) with a radius of 5 units.

13. Convert the following polar equation to rectangular form. Identify the curve.

$r = 20 \cos \theta$

The rectangular form of the polar equation is $y^2 + (x - 10)^2 = 100$.
(Type your answer in standard form.)

Identify the curve. Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

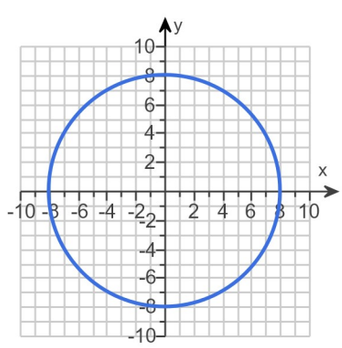
- **A.** A circle whose center is the ordered pair (10,0) and a radius of 10 unit(s).
- **B.** A line with a slope _____ and a y-intercept _____.
- **C.** A vertical line.

14. Sketch the graph of the following polar equation by transforming it to rectangular coordinates.

$r = -8$

The rectangular equation for $r = -8$ is $x^2 + y^2 = 64$.
(Type an equation. Use integers or decimals for any numbers in the equation.)

Use the graphing tool to graph the equation.

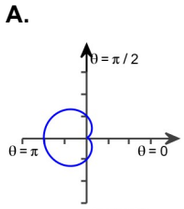


15. Sketch the graph of the following polar equation. Then identify the curve.

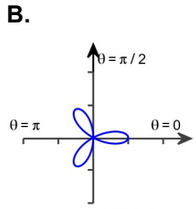
$r = 3 \cos \theta$

Choose the correct graph below.

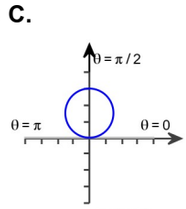
- **A.**



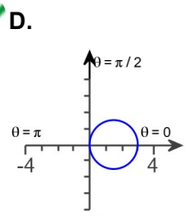
- **B.**



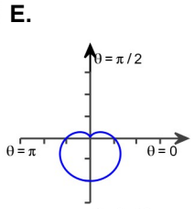
- **C.**



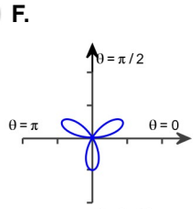
- **D.**



- **E.**



- **F.**



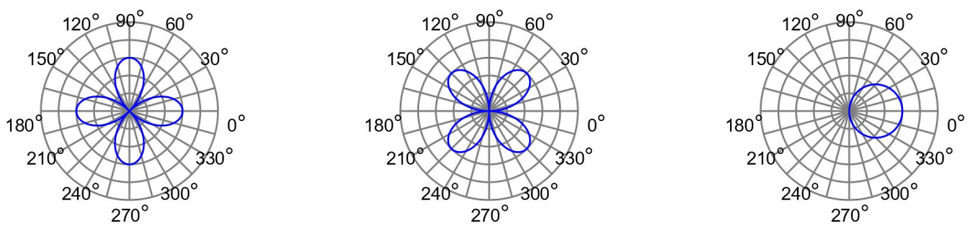
The curve of $r = 3 \cos \theta$ is a circle.

16. Graph the equation.

$r = 6 \cos 2\theta$

Choose the correct graph below. The scale on r is from -10 to 10 in increments of 2.

A. **B.** **C.**



17. Watch the video and then solve the problem below.

Click here to watch the video.[1]

Find polar coordinates (r,θ) of the point P whose rectangular coordinates are $\left(-5\sqrt{3}, -5\right)$.

Choose the correct answer below.

- **A.** $(10,210^\circ)$
- **B.** $(10,30^\circ)$
- **C.** $(-10,210^\circ)$
- **D.** $(-10,150^\circ)$

1: http://mediaplayer.pearsoncmg.com/assets/Cn1hg4SGtuUHHxHxm9lH_hd72oi2P6p5?clip=3

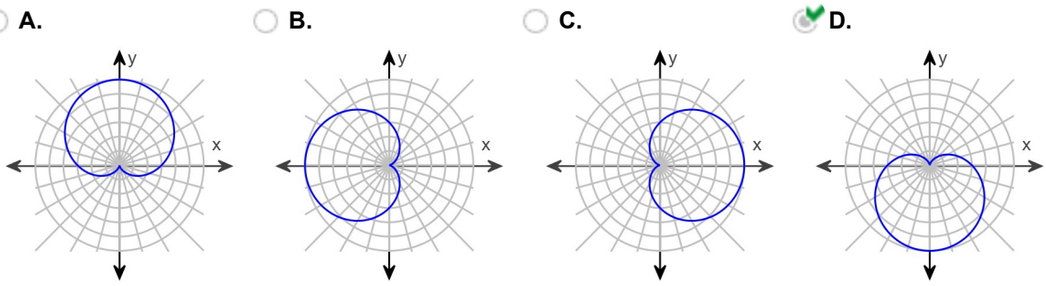
18. Watch the video and then solve the problem below.

Click here to watch the video.[2]

Sketch the graph of $r = 3(1 - \sin\theta)$.

Choose the correct graph below.

A. **B.** **C.** **D.**



2: http://mediaplayer.pearsoncmg.com/assets/Cn1hg4SGtuUHHxHxm9lH_hd72oi2P6p5?clip=8