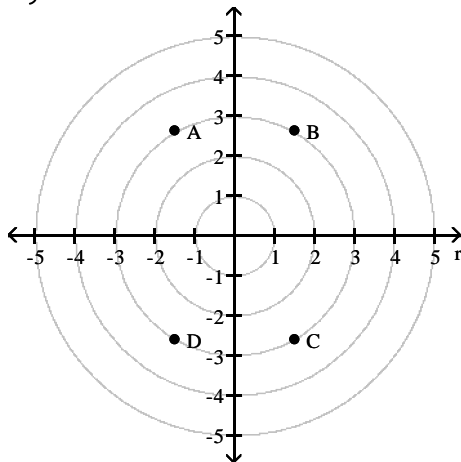


Name \_\_\_\_\_

Match the point in polar coordinates with either A, B, C, or D on the graph.

1)  $\left(-3, \frac{\pi}{3}\right)$

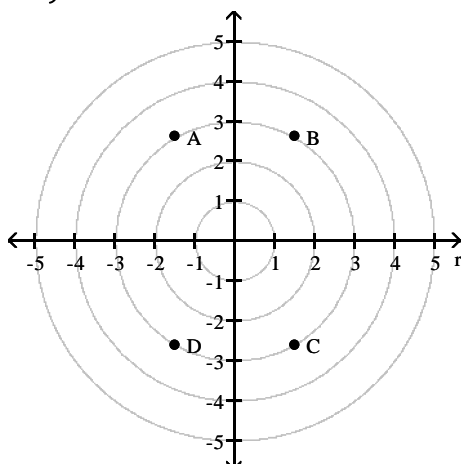
1) \_\_\_\_\_



Objective: (9.1) Plot Points Using Polar Coordinates

2)  $\left(3, -\frac{5\pi}{3}\right)$

2) \_\_\_\_\_

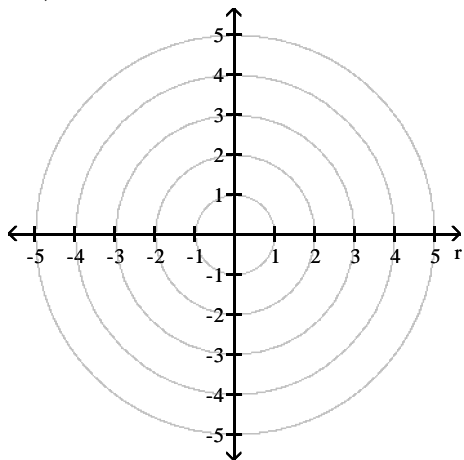


Objective: (9.1) Plot Points Using Polar Coordinates

Plot the point given in polar coordinates.

3)  $(-2, 45^\circ)$

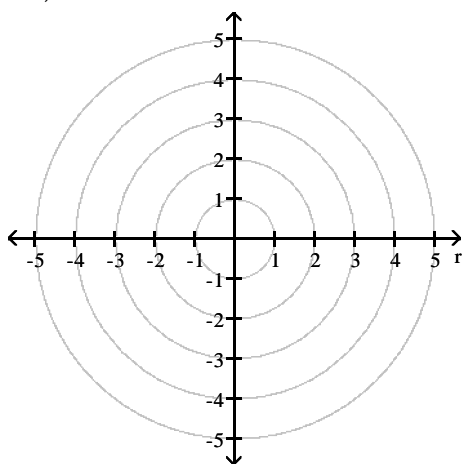
3) \_\_\_\_\_



Objective: (9.1) Plot Points Using Polar Coordinates

4)  $(2, 360^\circ)$

4) \_\_\_\_\_

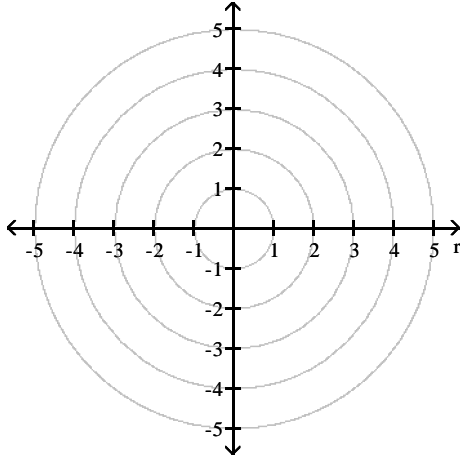


Objective: (9.1) Plot Points Using Polar Coordinates

Solve the problem.

- 5) Plot the point  $\left(4, \frac{5\pi}{6}\right)$  and find other polar coordinates  $(r, \theta)$  of the point for which:
- (a)  $r > 0, -2\pi \leq \theta < 0$
  - (b)  $r < 0, 0 \leq \theta < 2\pi$
  - (c)  $r > 0, 2\pi \leq \theta < 4\pi$

5) \_\_\_\_\_



Objective: (9.1) Plot Points Using Polar Coordinates

The polar coordinates of a point are given. Find the rectangular coordinates of the point.

6)  $\left(7, \frac{2\pi}{3}\right)$

6) \_\_\_\_\_

Objective: (9.1) Convert from Polar Coordinates to Rectangular Coordinates

7)  $\left(5, -\frac{4\pi}{3}\right)$

7) \_\_\_\_\_

Objective: (9.1) Convert from Polar Coordinates to Rectangular Coordinates

8)  $(-3, -135^\circ)$

8) \_\_\_\_\_

Objective: (9.1) Convert from Polar Coordinates to Rectangular Coordinates

The rectangular coordinates of a point are given. Find polar coordinates for the point.

9)  $(0, -8)$

9) \_\_\_\_\_

Objective: (9.1) Convert from Rectangular Coordinates to Polar Coordinates

10)  $(-\sqrt{3}, -1)$

10) \_\_\_\_\_

Objective: (9.1) Convert from Rectangular Coordinates to Polar Coordinates

The letters  $x$  and  $y$  represent rectangular coordinates. Write the equation using polar coordinates  $(r, \theta)$ .

11)  $x^2 + y^2 - 4x = 0$

11) \_\_\_\_\_

Objective: (9.1) Transform Equations between Polar and Rectangular Forms

12)  $xy = 1$

12) \_\_\_\_\_

Objective: (9.1) Transform Equations between Polar and Rectangular Forms

The letters  $r$  and  $\theta$  represent polar coordinates. Write the equation using rectangular coordinates  $(x, y)$ .

13)  $r = 1 + 2 \sin \theta$

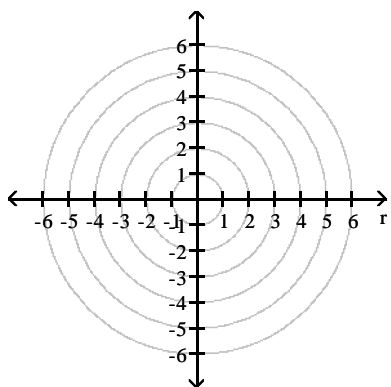
13) \_\_\_\_\_

Objective: (9.1) Transform Equations between Polar and Rectangular Forms

Transform the polar equation to an equation in rectangular coordinates. Then identify and graph the equation.

14)  $r = 5$

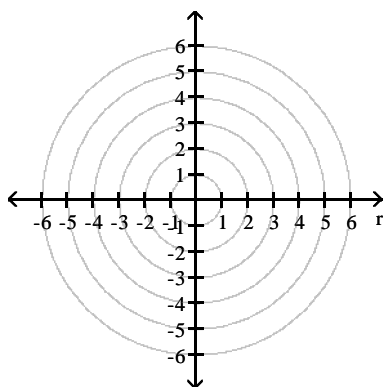
14) \_\_\_\_\_



Objective: (9.2) Identify and Graph Polar Equations by Converting to Rectangular Equations

15)  $r = 2 \cos \theta$

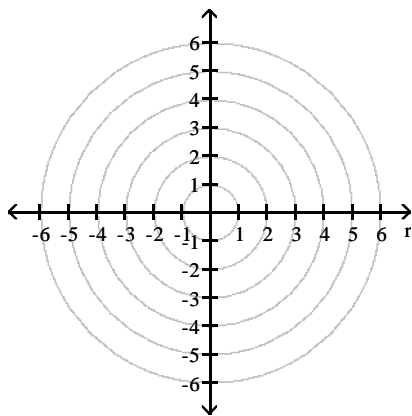
15) \_\_\_\_\_



Objective: (9.2) Identify and Graph Polar Equations by Converting to Rectangular Equations

16)  $r \sin \theta = 5$

16) \_\_\_\_\_

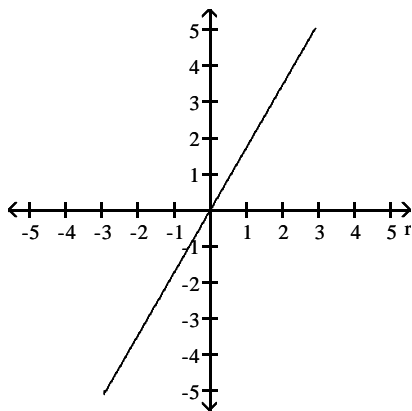


Objective: (9.2) Identify and Graph Polar Equations by Converting to Rectangular Equations

Match the graph to one of the polar equations.

17)

17) \_\_\_\_\_



A)  $\theta = \frac{\pi}{3}$

B)  $r = -\frac{\pi}{3}$

C)  $\theta = -\frac{\pi}{3}$

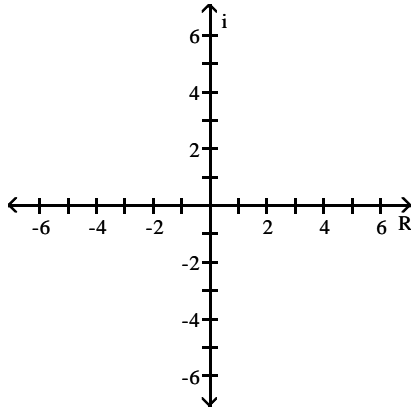
D)  $r = \frac{\pi}{3}$

Objective: (9.2) Identify and Graph Polar Equations by Converting to Rectangular Equations

Plot the complex number in the complex plane.

18)  $6 + 5i$

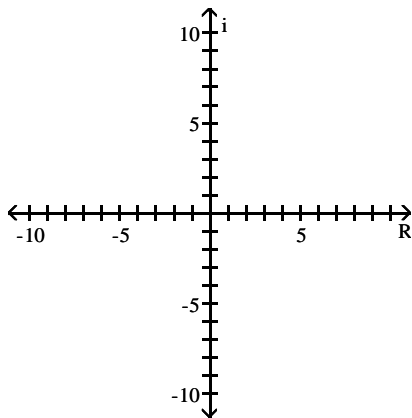
18) \_\_\_\_\_



Objective: (9.3) Plot Points in the Complex Plane

19)  $-8 + \sqrt{7}i$

19) \_\_\_\_\_



Objective: (9.3) Plot Points in the Complex Plane

Write the complex number in rectangular form.

20)  $8 \left( \cos \frac{\pi}{6} + i \sin \frac{\pi}{6} \right)$

20) \_\_\_\_\_

Objective: (9.3) Plot Points in the Complex Plane

21)  $4(\cos 300^\circ + i \sin 300^\circ)$

21) \_\_\_\_\_

Objective: (9.3) Plot Points in the Complex Plane

22)  $9(\cos 180^\circ + i \sin 180^\circ)$

22) \_\_\_\_\_

Objective: (9.3) Plot Points in the Complex Plane

Write the complex number in polar form. Express the argument in degrees, rounded to the nearest tenth, if necessary.

23)  $2 + 2i$

23) \_\_\_\_\_

Objective: (9.3) Convert a Complex Number between Rectangular Form and Polar Form

24)  $-6$

24) \_\_\_\_\_

Objective: (9.3) Convert a Complex Number between Rectangular Form and Polar Form

25)  $-12 + 16i$

25) \_\_\_\_\_

Objective: (9.3) Convert a Complex Number between Rectangular Form and Polar Form

Find  $zw$  or  $\frac{z}{w}$  as specified. Leave your answer in polar form.

26)  $z = 5(\cos 35^\circ + i \sin 35^\circ)$

$w = 2(\cos 40^\circ + i \sin 40^\circ)$

Find  $zw$ .

26) \_\_\_\_\_

Objective: (9.3) Find Products and Quotients of Complex Numbers in Polar Form



27)  $z = 10(\cos 30^\circ + i \sin 30^\circ)$   
 $w = 5(\cos 10^\circ + i \sin 10^\circ)$   
Find  $\frac{z}{w}$ .

27) \_\_\_\_\_

Objective: (9.3) Find Products and Quotients of Complex Numbers in Polar Form

Write the expression in the standard form  $a + bi$ .

28)  $[2(\cos 15^\circ + i \sin 15^\circ)]^3$

28) \_\_\_\_\_

Objective: (9.3) Use De Moivre's Theorem

29)  $[2(\cos 75^\circ + i \sin 75^\circ)]^3$

29) \_\_\_\_\_

Objective: (9.3) Use De Moivre's Theorem

30)  $\left[ \sqrt{2} \left( \cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4} \right) \right]^4$

30) \_\_\_\_\_

Objective: (9.3) Use De Moivre's Theorem

31)  $\left[ \sqrt{3} \left( \cos \frac{5\pi}{6} + i \sin \frac{5\pi}{6} \right) \right]^4$

31) \_\_\_\_\_

Objective: (9.3) Use De Moivre's Theorem

32)  $(1 + i)^{20}$

32) \_\_\_\_\_

Objective: (9.3) Use De Moivre's Theorem

Find all the complex roots. Leave your answers in polar form with the argument in degrees.

33) The complex fourth roots of  $-16$

33) \_\_\_\_\_

Objective: (9.3) Find Complex Roots

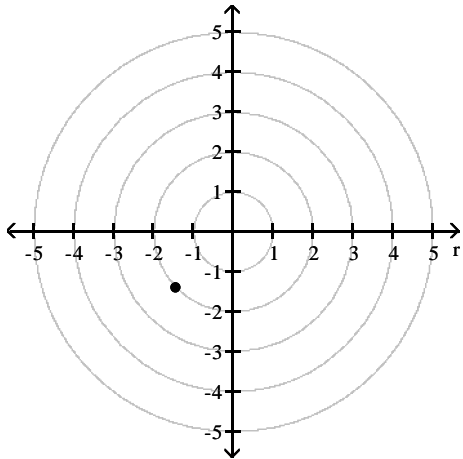
Answer Key

Testname: 13SPR\_CH9\_MATH2\_HW\_6

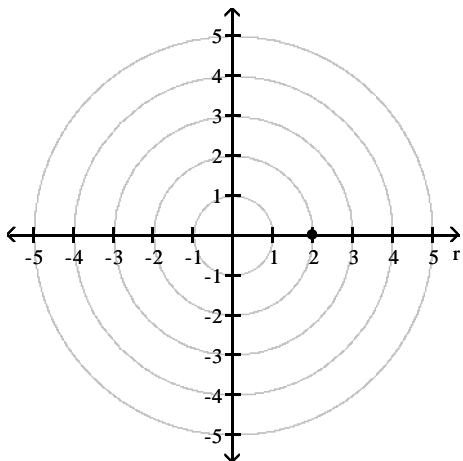
1) D

2) B

3)



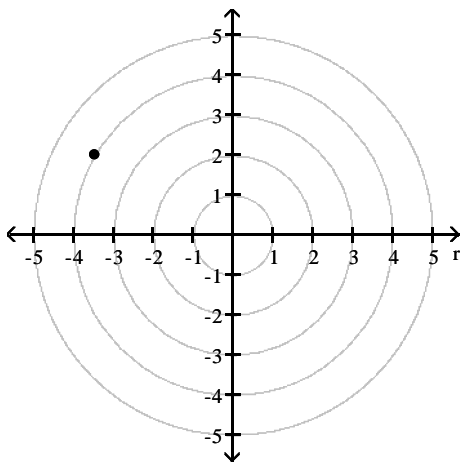
4)



Answer Key

Testname: 13SPR\_CH9\_MATH2\_HW\_6

5)



(a)  $\left(4, -\frac{7\pi}{6}\right)$

(b)  $\left(-4, \frac{11\pi}{6}\right)$

(c)  $\left(4, \frac{17\pi}{6}\right)$

6)  $\left(-\frac{7}{2}, \frac{7\sqrt{3}}{2}\right)$

7)  $\left(-\frac{5}{2}, \frac{5\sqrt{3}}{2}\right)$

8)  $\left(\frac{3\sqrt{2}}{2}, \frac{3\sqrt{2}}{2}\right)$

9)  $\left(8, -\frac{\pi}{2}\right)$

10)  $\left(2, -\frac{5\pi}{6}\right)$

11)  $r = 4 \cos \theta$

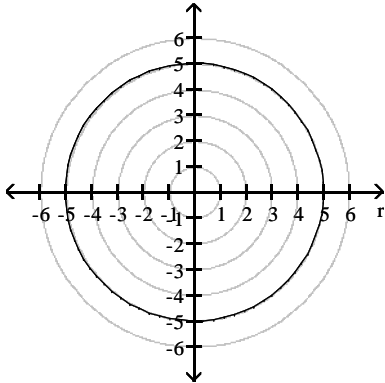
12)  $r^2 \sin 2\theta = 2$

13)  $x^2 + y^2 = \sqrt{x^2 + y^2} + 2y$

Answer Key

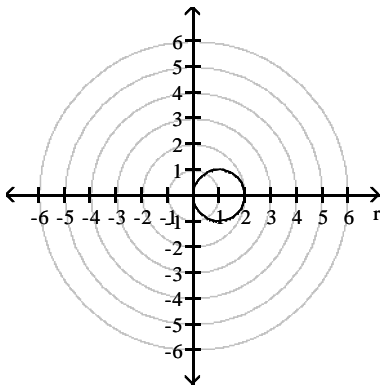
Testname: 13SPR\_CH9\_MATH2\_HW\_6

14)



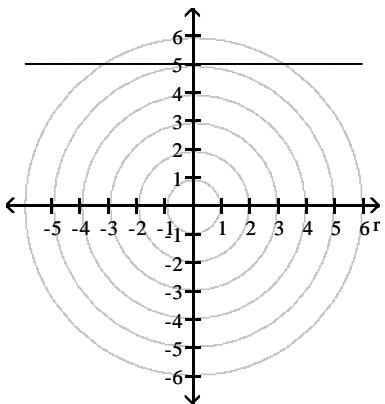
$x^2 + y^2 = 25$ ; circle, radius 5,  
center at pole

15)



$(x - 1)^2 + y^2 = 1$ ; circle, radius 1,  
center at (1, 0) in rectangular coordinates

16)



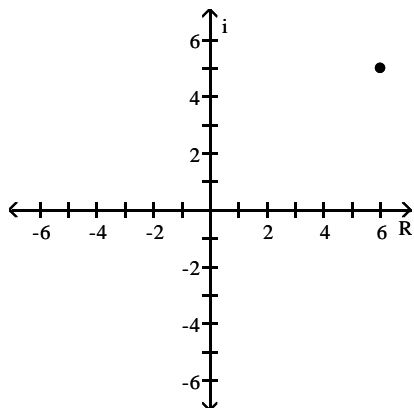
$y = 5$ ; horizontal line 5 units  
above the pole

17) A

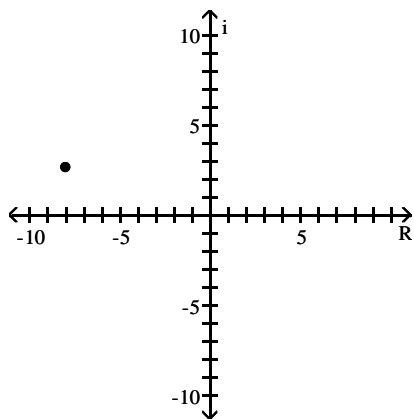
Answer Key

Testname: 13SPR\_CH9\_MATH2\_HW\_6

18)



19)



20)  $4\sqrt{3} + 4i$

21)  $2 - 2\sqrt{3}i$

22)  $-9$

23)  $2\sqrt{2}(\cos 45^\circ + i \sin 45^\circ)$

24)  $6(\cos 180^\circ + i \sin 180^\circ)$

25)  $20(\cos 126.9^\circ + i \sin 126.9^\circ)$

26)  $10(\cos 75^\circ + i \sin 75^\circ)$

27)  $2(\cos 20^\circ + i \sin 20^\circ)$

28)  $4\sqrt{2} + 4\sqrt{2}i$

29)  $-4\sqrt{2} - 4\sqrt{2}i$

30)  $-4$

31)  $-\frac{9}{2} - \frac{9\sqrt{3}}{2}i$

32)  $-1024$

33)  $2(\cos 45^\circ + i \sin 45^\circ), 2(\cos 135^\circ + i \sin 135^\circ), 2(\cos 225^\circ + i \sin 225^\circ), 16(\cos 315^\circ + i \sin 315^\circ)$