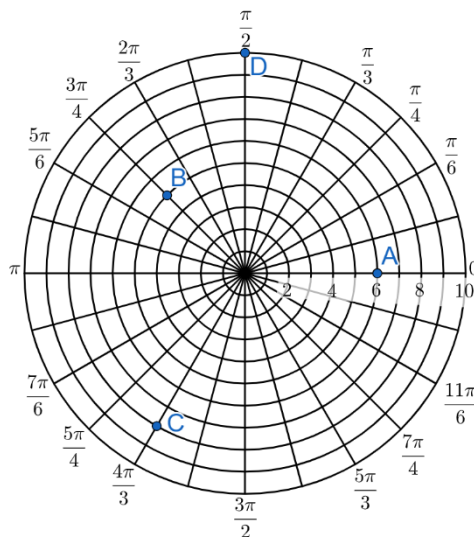


Polar Coordinates (3.13) Homework

1. Express the location of each of the points graphed to the right in polar coordinates. For each point, give two different forms of expressing the location of the point in polar coordinates.



The location of each of the following points is given in polar coordinates. For each point, convert the location to rectangular coordinates.

2. $\left(4, \frac{\pi}{6}\right)$

4. $\left(-2, \frac{3\pi}{4}\right)$

3. $\left(10, -\frac{2\pi}{3}\right)$

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

The location of each of the following points is given in rectangular coordinates. For each point, convert the location to polar coordinates.

6. $(-6, 0)$

8. $(-2, 2\sqrt{3})$

7. $(3, -3)$

9. $(0, -5)$

In each question, three of the four given polar coordinate pairs are different representations of the same point. One of the polar coordinate pairs does not correspond to the same point as the others. Determine which does not belong in each set.

10. $\left(-4, -\frac{\pi}{6}\right)$ $\left(4, \frac{7\pi}{6}\right)$ $\left(4, \frac{5\pi}{6}\right)$ $\left(-4, \frac{11\pi}{6}\right)$

11. $\left(-1, -\frac{3\pi}{2}\right)$ $\left(-1, \frac{\pi}{2}\right)$ $\left(1, \frac{3\pi}{2}\right)$ $\left(1, \frac{5\pi}{2}\right)$

12. $\left(-6, \frac{9\pi}{4}\right)$ $\left(6, \frac{\pi}{4}\right)$ $\left(6, -\frac{3\pi}{4}\right)$ $\left(6, \frac{5\pi}{4}\right)$

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

14. A complex number is represented by the point in the complex plane with rectangular coordinates $(\sqrt{3}, 1)$. Which one of the following is one way to represent this complex number using polar coordinates?

(A) $\left(\sqrt{3} \cos\left(\frac{\pi}{6}\right) + i\left(\sqrt{3} \sin\left(\frac{\pi}{6}\right)\right)\right)$

(B) $\left(\sqrt{3} \cos\left(-\frac{\pi}{6}\right) + i\left(\sqrt{3} \sin\left(-\frac{\pi}{6}\right)\right)\right)$

(C) $\left(2 \cos\left(\frac{\pi}{6}\right) + i\left(2 \sin\left(\frac{\pi}{6}\right)\right)\right)$

(D) $\left(2 \cos\left(-\frac{\pi}{6}\right) + i\left(2 \sin\left(-\frac{\pi}{6}\right)\right)\right)$

15. Which one of the following is the rectangular representation of the location of the point in the complex plane corresponding with $\left(4 \cos\left(\frac{2\pi}{3}\right) + i\left(4 \sin\left(\frac{2\pi}{3}\right)\right)\right)$

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

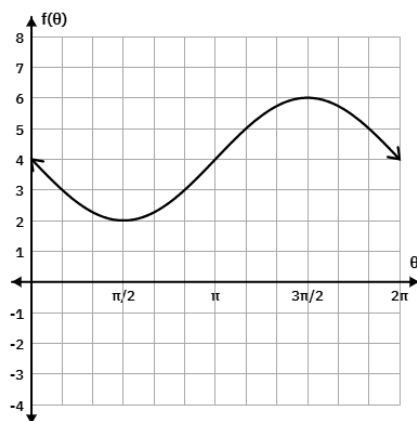
(B) $(-2\sqrt{3}, 2)$

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

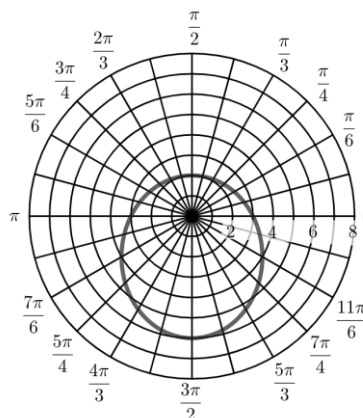
(D) $(2\sqrt{3}, -2)$

Each numbered graph on the left is a rectangular graph of a relationship between θ and $f(\theta)$. On the right are polar representations of these relationships. Match the number of each rectangular graph with the letter of the corresponding polar graph.

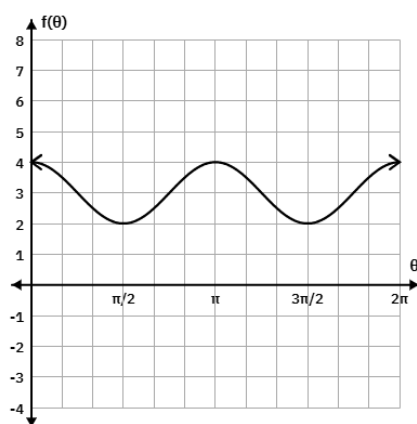
16.



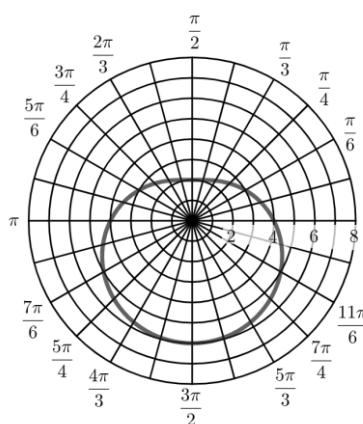
(A)



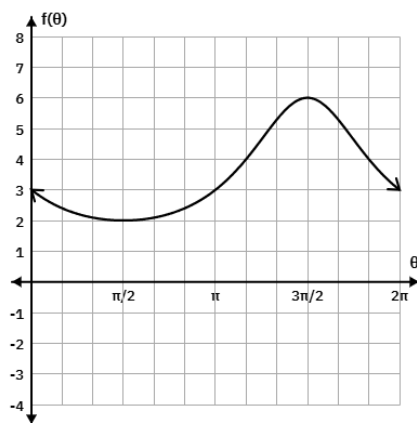
17.



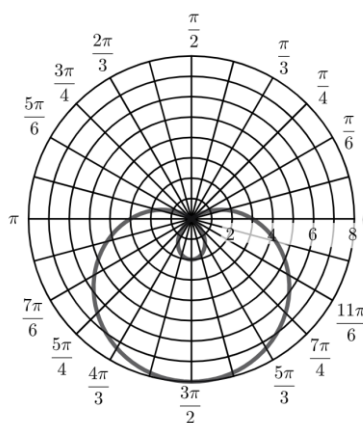
(B)



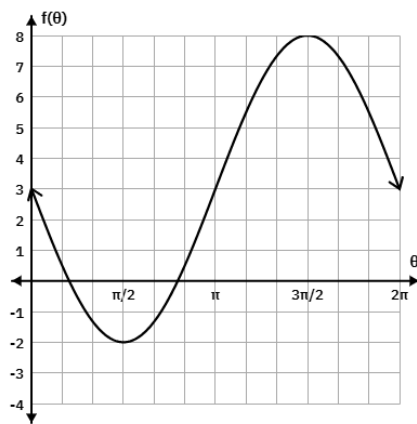
18.



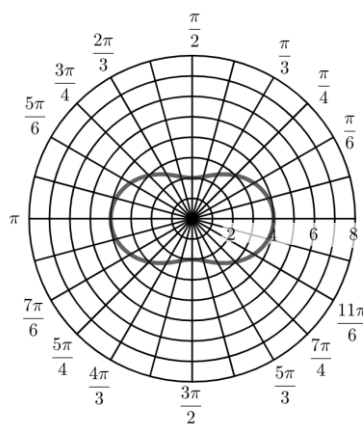
(C)



19.



(D)



Polar Coordinates HW Answers

1. $A = (-6, -\pi) = (6, 0) = (-6, \pi) = (6, 2\pi) = (-6, 3\pi)$
 $B = \left(-5, -\frac{\pi}{4}\right) = \left(5, \frac{3\pi}{4}\right) = \left(-5, \frac{7\pi}{4}\right) = \left(5, \frac{11\pi}{4}\right) = \left(-5, \frac{15\pi}{4}\right)$
 $C = \left(8, -\frac{2\pi}{3}\right) = \left(-8, \frac{\pi}{3}\right) = \left(8, \frac{4\pi}{3}\right) = \left(-8, \frac{7\pi}{3}\right) = \left(8, \frac{10\pi}{3}\right)$
 $D = \left(-10, -\frac{\pi}{2}\right) = \left(10, \frac{\pi}{2}\right) = \left(-10, \frac{3\pi}{2}\right) = \left(10, \frac{5\pi}{2}\right) = \left(-10, \frac{7\pi}{2}\right)$
2. $(2\sqrt{3}, 2)$
3. $(-5, -5\sqrt{3})$
4. $(\sqrt{2}, -\sqrt{2})$
5. $(0, 5)$

For questions #6-9, there are many ways to answer correctly. If you are unsure if your answer is correct, just ask.

6. $(6, \pi)$
7. $\left(3\sqrt{2}, \frac{7\pi}{4}\right)$
8. $\left(4, \frac{2\pi}{3}\right)$
9. $\left(5, \frac{3\pi}{2}\right)$
10. $\left(4, \frac{7\pi}{6}\right)$
11. $\left(1, \frac{5\pi}{2}\right)$
12. $\left(6, \frac{\pi}{4}\right)$
13. $\left(-5, \frac{\pi}{3}\right)$
14. (C) $\left(2 \cos\left(\frac{\pi}{6}\right)\right) + i \left(2 \sin\left(\frac{\pi}{6}\right)\right)$
15. (A) $(-2, 2\sqrt{3})$
16. (B)
17. (D)
18. (A)
19. (C)