

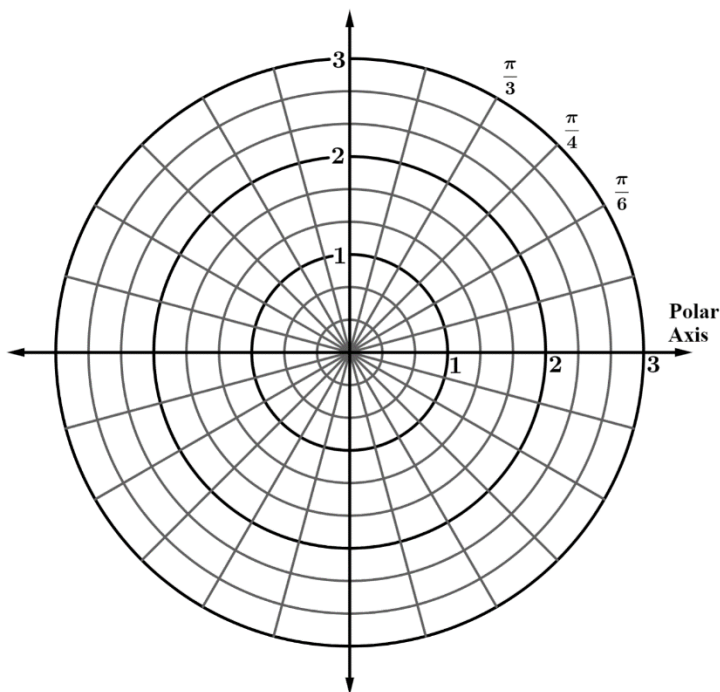
1. Plot (and label) the following polar coordinates on the polar coordinate grid above.

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

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

$$C\left(1.5, \frac{\pi}{4}\right)$$

$$D\left(1, \frac{\pi}{2}\right)$$



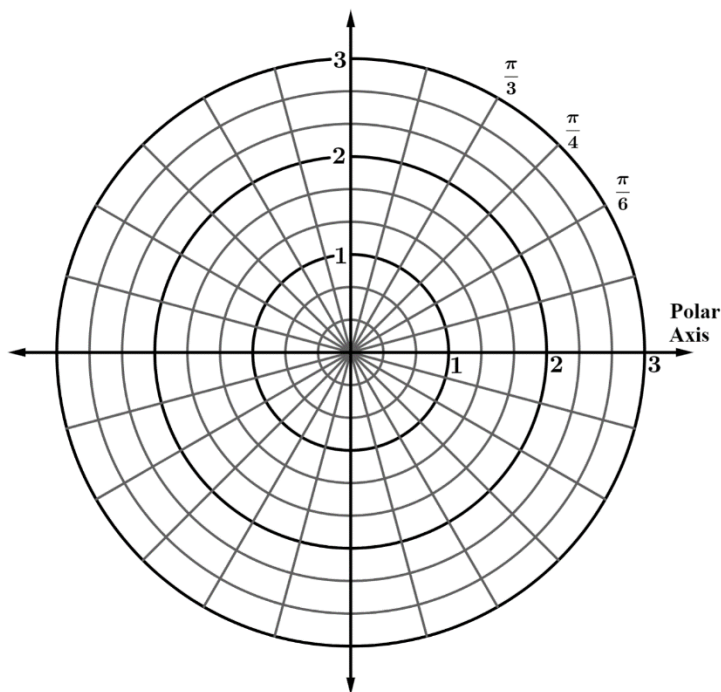
2. Plot (and label) the following polar coordinates on the polar coordinate grid above.

$$A\left(-3, \frac{5\pi}{6}\right)$$

$$B(-2, \pi)$$

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

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



3. Plot (and label) the following polar coordinates on the polar coordinate grid above.

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

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

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

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

4. The location of a point in the plane is given by polar coordinates  $\left(4, \frac{5\pi}{6}\right)$ . Write two different representations for this point in polar coordinates.

5. The location of a point in the plane is given by polar coordinates  $\left(-3, \frac{5\pi}{4}\right)$ . Write two different representations for this point in polar coordinates.

6. The location of a point in the plane is given by polar coordinates  $\left(2, \frac{3\pi}{2}\right)$ . Write two different representations for this point in polar coordinates.

7. The location of a point in the plane is given by polar coordinates  $\left(5, \frac{4\pi}{3}\right)$ . Which of the following gives another representation for this point in polar coordinates?

- (A)  $\left(-5, -\frac{4\pi}{3}\right)$       (B)  $\left(-5, \frac{4\pi}{3}\right)$       (C)  $\left(5, -\frac{2\pi}{3}\right)$       (D)  $\left(5, -\frac{\pi}{3}\right)$

8. The location of a point in the plane is given by polar coordinates  $\left(-2, \frac{\pi}{2}\right)$ . Which of the following gives another representation for this point in polar coordinates?

- (A)  $\left(-2, \frac{3\pi}{2}\right)$       (B)  $\left(2, \frac{\pi}{2}\right)$       (C)  $\left(2, -\frac{3\pi}{2}\right)$       (D)  $\left(2, -\frac{\pi}{2}\right)$

9. The location of a point in the plane is given by polar coordinates  $\left(-4, \frac{5\pi}{6}\right)$ . Which of the following gives another representation for this point in polar coordinates?

- (A)  $\left(4, \frac{5\pi}{6}\right)$       (B)  $\left(4, \frac{7\pi}{6}\right)$       (C)  $\left(4, \frac{11\pi}{6}\right)$       (D)  $\left(-4, -\frac{5\pi}{6}\right)$

10. The location of point  $A$  in polar coordinates  $(r, \theta)$  is  $\left(2, \frac{5\pi}{3}\right)$ . Which of the following describes the location of point  $A$  in rectangular coordinates  $(x, y)$ ?

- (A)  $(1, \sqrt{3})$       (B)  $(-1, \sqrt{3})$       (C)  $(1, -\sqrt{3})$       (D)  $(\sqrt{3}, -1)$

11. The location of point  $B$  in polar coordinates  $(r, \theta)$  is  $\left(1, \frac{2\pi}{3}\right)$ . Which of the following describes the location of point  $B$  in rectangular coordinates  $(x, y)$ ?

- (A)  $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$       (B)  $\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$       (C)  $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$       (D)  $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

12. The location of point  $X$  in polar coordinates  $(r, \theta)$  is  $\left(-4, \frac{\pi}{3}\right)$ . Which of the following describes the location of point  $X$  in rectangular coordinates  $(x, y)$ ?

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

13. The location of point  $D$  in polar coordinates  $(r, \theta)$  is  $\left(-1, -\frac{\pi}{6}\right)$ . Which of the following describes the location of point  $D$  in rectangular coordinates  $(x, y)$ ?

- (A)  $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$                       (B)  $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$                       (C)  $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$                       (D)  $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

14. The location of point  $X$  in rectangular coordinates  $(x, y)$  is  $(3, 0)$ . Which of the following describes the location of point  $X$  in polar coordinates  $(r, \theta)$ ?

- (A)  $\left(3, \frac{\pi}{2}\right)$                       (B)  $(3, \pi)$                       (C)  $(-3, \pi)$                       (D)  $(-3, 2\pi)$

15. The location of point  $A$  in rectangular coordinates  $(x, y)$  is  $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ . Which of the following describes the location of point  $A$  in polar coordinates  $(r, \theta)$ ?

- (A)  $\left(1, \frac{\pi}{3}\right)$                       (B)  $\left(1, \frac{5\pi}{6}\right)$                       (C)  $\left(1, \frac{2\pi}{3}\right)$                       (D)  $\left(1, \frac{4\pi}{3}\right)$

16. The location of point  $B$  in rectangular coordinates  $(x, y)$  is  $(-\sqrt{2}, -\sqrt{2})$ . Which of the following describes the location of point  $B$  in polar coordinates  $(r, \theta)$ ?

- (A)  $\left(2, \frac{5\pi}{4}\right)$                       (B)  $\left(2, \frac{7\pi}{4}\right)$                       (C)  $\left(-2, \frac{5\pi}{4}\right)$                       (D)  $\left(-2, \frac{7\pi}{4}\right)$

17. A complex number is represented by a point in the complex plane. The complex number has the rectangular coordinates  $(2, -2)$ . Which of the following is one way to express the complex number using its polar coordinates  $(r, \theta)$ ?

(A)  $\left(2\sqrt{2} \cos\left(\frac{\pi}{4}\right)\right) + i\left(2\sqrt{2} \sin\left(\frac{\pi}{4}\right)\right)$

(B)  $\left(2 \cos\left(\frac{\pi}{4}\right)\right) + i\left(2 \sin\left(\frac{\pi}{4}\right)\right)$

(C)  $\left(2\sqrt{2} \cos\left(-\frac{\pi}{4}\right)\right) + i\left(2\sqrt{2} \sin\left(-\frac{\pi}{4}\right)\right)$

(D)  $\left(2 \cos\left(-\frac{\pi}{4}\right)\right) + i\left(2 \sin\left(-\frac{\pi}{4}\right)\right)$

18. A complex number is represented by a point in the complex plane. The complex number has the rectangular coordinates  $\left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$ . Which of the following is one way to express the complex number using its polar coordinates  $(r, \theta)$ ?

(A)  $\left(\cos\left(\frac{5\pi}{6}\right)\right) + i\left(\sin\left(\frac{5\pi}{6}\right)\right)$

(B)  $\left(\cos\left(\frac{7\pi}{6}\right)\right) + i\left(\sin\left(\frac{7\pi}{6}\right)\right)$

(C)  $\left(\cos\left(\frac{4\pi}{3}\right)\right) + i\left(\sin\left(\frac{4\pi}{3}\right)\right)$

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

19. A complex number is represented by a point in the complex plane. In polar coordinates, the complex number can be expressed as  $\left(2 \cos\left(-\frac{\pi}{3}\right)\right) + i\left(2 \sin\left(-\frac{\pi}{3}\right)\right)$ . Express the complex number using its rectangular coordinates  $(x, y)$ .

(A)  $(1, \sqrt{3})$       (B)  $(1, -\sqrt{3})$       (C)  $(-\sqrt{3}, 1)$       (D)  $(2, 2\sqrt{3})$

20. A complex number is represented by a point in the complex plane. In polar coordinates, the complex number can be expressed as  $\left(10 \cos\left(\frac{5\pi}{4}\right)\right) + i\left(10 \sin\left(\frac{5\pi}{4}\right)\right)$ . Express the complex number using its rectangular coordinates  $(x, y)$ .

(A)  $(-5\sqrt{2}, -5\sqrt{2})$       (B)  $(-5\sqrt{2}, 5\sqrt{2})$       (C)  $(5\sqrt{2}, -5\sqrt{2})$       (D)  $(5\sqrt{2}, 5\sqrt{2})$

