


PW#3: Graphing Polar Coordinates


- ① $(4, 30^\circ)$ $x = 4 \cos 30^\circ$ $y = 4 \sin 30^\circ$ $(2\sqrt{3}, 2)$
 $x = 4\left(\frac{\sqrt{3}}{2}\right)$ $y = 4\left(\frac{1}{2}\right)$
 $x = 2\sqrt{3}$ $y = 2$
- ② $(2, 45^\circ)$ $x = 2 \cos 45^\circ$ $y = 2 \sin 45^\circ$ $(\sqrt{2}, \sqrt{2})$
 $x = 2\left(\frac{\sqrt{2}}{2}\right)$ $y = 2\left(\frac{\sqrt{2}}{2}\right)$
 $x = \sqrt{2}$ $y = \sqrt{2}$
- ③ $(-3, 120^\circ)$ $x = -3 \cos 120^\circ$ $y = -3 \sin 120^\circ$ $\left(\frac{3}{2}, -\frac{3\sqrt{3}}{2}\right)$
 $x = -3\left(-\frac{1}{2}\right)$ $y = -3\left(\frac{\sqrt{3}}{2}\right)$
 $x = \frac{3}{2}$ $y = -\frac{3\sqrt{3}}{2}$
- ④ $(-5, 135^\circ)$ $x = -5 \cos 135^\circ$ $y = -5 \sin 135^\circ$ $\left(\frac{5\sqrt{2}}{2}, -\frac{5\sqrt{2}}{2}\right)$
 $x = -5\left(-\frac{\sqrt{2}}{2}\right)$ $y = -5\left(\frac{\sqrt{2}}{2}\right)$
 $x = \frac{5\sqrt{2}}{2}$ $y = -\frac{5\sqrt{2}}{2}$
- ⑤ $(7, -60^\circ)$ $x = 7 \cos(-60^\circ)$ $y = 7 \sin(-60^\circ)$ $\left(\frac{7}{2}, -\frac{7\sqrt{3}}{2}\right)$
 $x = 7\left(\frac{1}{2}\right)$ $y = 7\left(-\frac{\sqrt{3}}{2}\right)$
 $x = \frac{7}{2}$ $y = -\frac{7\sqrt{3}}{2}$
- ⑥ $(6, -45^\circ)$ $x = 6 \cos(-45^\circ)$ $y = 6 \sin(-45^\circ)$ $(3\sqrt{2}, -3\sqrt{2})$
 $x = 6\left(\frac{\sqrt{2}}{2}\right)$ $y = 6\left(-\frac{\sqrt{2}}{2}\right)$
 $x = 3\sqrt{2}$ $y = -3\sqrt{2}$
- ⑦ $(-6, -150^\circ)$ $x = -6 \cos(-150^\circ)$ $y = -6 \sin(-150^\circ)$ $(3\sqrt{3}, 3)$
 $x = -6\left(-\frac{\sqrt{3}}{2}\right)$ $y = -6\left(-\frac{1}{2}\right)$
 $x = 3\sqrt{3}$ $y = 3$

⑧ $(-3, -120^\circ)$ $x = -3 \cos(-120^\circ)$ $y = -3 \sin(-120^\circ)$ $\left(\frac{3}{2}, \frac{3\sqrt{3}}{2}\right)$
 $x = -3\left(\frac{1}{2}\right)$ $y = -3\left(-\frac{\sqrt{3}}{2}\right)$
 $x = \frac{3}{2}$ $y = \frac{3\sqrt{3}}{2}$


⑨ $(4, 0)$ $r^2 = 4^2 + 0^2$ $\tan^{-1}\left(\frac{0}{4}\right) = \theta$ $(-4, 180^\circ)$ $(4, 0^\circ)$
 $r^2 = 4^2$ $0^\circ = \theta$ $(-4, -180^\circ)$
 $r = \pm 4$




⑩ $(0, -3)$ $r^2 = 0^2 + (-3)^2$ $\tan^{-1}\left(\frac{-3}{0}\right) = \theta$ $(3, 270^\circ)$ $(-3, 90^\circ)$
 $r^2 = 9$ $-90^\circ = \theta$ $(3, -90^\circ)$ $(-3, -270^\circ)$
 $r = \pm 3$




⑪ $(-2, 2)$ $r^2 = (-2)^2 + 2^2$ $\tan^{-1}(-1) = \theta$ $(2\sqrt{2}, 135^\circ)$
 $r^2 = 8$ $-45^\circ = \theta$ $(2\sqrt{2}, -225^\circ)$
 $r = \pm 2\sqrt{2}$ $(-2\sqrt{2}, -45^\circ)$
 $(-2\sqrt{2}, 315^\circ)$




⑫ $(\sqrt{3}, -1)$ $r^2 = (\sqrt{3})^2 + (-1)^2$ $\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right) = \theta$
 $r^2 = 4$ $-30^\circ = \theta$
 $r = \pm 2$ $(2, 330^\circ)$ $(2, -30^\circ)$ $(-2, 150^\circ)$ $(-2, -210^\circ)$



⑬ $(-1, \sqrt{3})$ $r^2 = (-1)^2 + (\sqrt{3})^2$ $\tan^{-1}(-\sqrt{3}) = \theta$
 $r^2 = 4$ $-60^\circ = \theta$
 $r = \pm 2$ $(2, 120^\circ)$ $(2, -240^\circ)$ $(-2, -60^\circ)$ $(-2, 300^\circ)$



⑭ $(-\sqrt{2}, -\sqrt{2})$ $r^2 = (-\sqrt{2})^2 + (-\sqrt{2})^2$ $\tan^{-1}(1) = \theta$
 $r^2 = 4$ $45^\circ = \theta$
 $r = \pm 2$ $(-2, 45^\circ)$, $(-2, -315^\circ)$, $(2, 225^\circ)$ $(2, -135^\circ)$



$$\textcircled{15} (-\sqrt{5}, -\sqrt{5}) \quad r^2 = (-\sqrt{5})^2 + (-\sqrt{5})^2 \quad \tan^{-1}(-1) = \theta$$



$$r^2 = 10$$

$$-45^\circ = \theta$$

$$r = \pm\sqrt{10}$$

$$(\sqrt{10}, -135^\circ) \quad (\sqrt{10}, 225^\circ)$$

$$(-\sqrt{10}, 45^\circ) \quad (-\sqrt{10}, -315^\circ)$$

$$\textcircled{16} (-\sqrt{2}, \sqrt{6}) \quad r^2 = (-\sqrt{2})^2 + (\sqrt{6})^2 \quad \tan^{-1}(-\sqrt{3}) = \theta$$



$$r^2 = 8$$

$$-60^\circ = \theta$$

$$r = \pm 2\sqrt{2} \quad (-2\sqrt{2}, -60^\circ) \quad (2\sqrt{2}, 300^\circ)$$

$$(2\sqrt{2}, 120^\circ) \quad (2\sqrt{2}, -240^\circ)$$

$$\textcircled{17} \text{A} \text{ a) } (3, 60^\circ) \text{ b) } (-3, 240^\circ) \text{ c) } (3, -300^\circ) \text{ d) } (-3, -120^\circ)$$

$$\text{B} \text{ a) } (4, 270^\circ) \text{ b) } (-4, 90^\circ) \text{ c) } (4, -90^\circ) \text{ d) } (-4, -270^\circ)$$

$$\text{C} \text{ a) } (5, 225^\circ) \text{ b) } (-5, 45^\circ) \text{ c) } (5, -135^\circ) \text{ d) } (-5, -315^\circ)$$

$$\text{D} \text{ a) } (2, 120^\circ) \text{ b) } (-2, 300^\circ) \text{ c) } (2, -240^\circ) \text{ d) } (-2, -60^\circ)$$