

# ド・モアブルの定理

整数▲について

$$(\cos \bullet + i \sin \bullet)^{\blacktriangle} = \cos \blacktriangle \bullet + i \sin \blacktriangle \bullet$$

整数とは  $-2, -1, 0, 1, 2, 3, 4$  のような数字

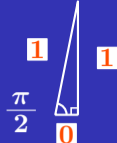
# 計算例

整数▲について

$$(\cos \bullet + i \sin \bullet)^\blacktriangle = \cos \blacktriangle \bullet + i \sin \blacktriangle \bullet$$

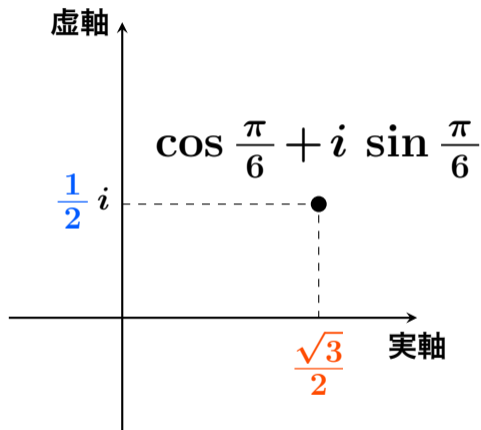
$$\begin{aligned} \left( \cos \frac{\pi}{6} + i \sin \frac{\pi}{6} \right)^3 &= \cos \left( 3 \cdot \frac{\pi}{6} \right) + i \sin \left( 3 \cdot \frac{\pi}{6} \right) \\ &= \cos \frac{\pi}{2} + i \sin \frac{\pi}{2} \end{aligned}$$

# 計算例



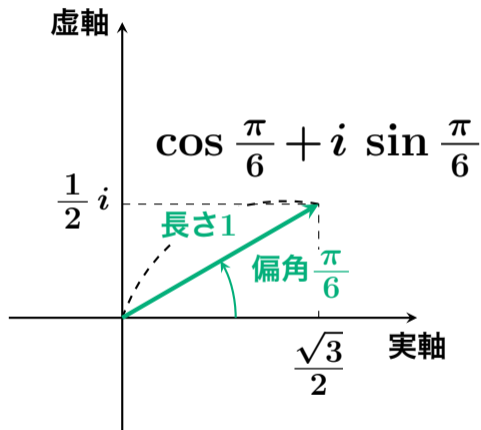
$$\begin{aligned}\left(\cos \frac{\pi}{6} + i \sin \frac{\pi}{6}\right)^3 &= \cos \frac{\pi}{2} + i \sin \frac{\pi}{2} \\ &= 0 + i \cdot 1 \\ &= i \quad \boxed{\text{答}}\end{aligned}$$

# $\cos \frac{\pi}{6} + i \sin \frac{\pi}{6}$ を複素数平面に図示すると



$$\begin{aligned} & \cos \frac{\pi}{6} + i \sin \frac{\pi}{6} \\ &= \frac{\sqrt{3}}{2} + \frac{1}{2} i \end{aligned}$$

×  $(\cos \frac{\pi}{6} + i \sin \frac{\pi}{6})$  の図形的意味は



角度  $\frac{\pi}{6}$  だけ回転させて

長さを1倍する

$$\begin{aligned} \text{長さ} &= \sqrt{\left(\frac{\sqrt{3}}{2}\right)^2 + \left(\frac{1}{2}\right)^2} \\ &= 1 \end{aligned}$$

# だからこうなる

