3回目課題3

番号：　　名前：　解　答

令和元年10月23日(水)

1　次の直交座標で表された複素数を極座標$(re^{j\theta})$で示せ．(ただし，$-\pi < \theta \leq \pi$)とする．

例　$1+j\sqrt{3} = 2e^{j\frac{\pi}{3}}$

(1)　$4-j4 = 4\sqrt{2}e^{-j\frac{\pi}{4}}$

(2)　$2\sqrt{3}+j2 = 4e^{j\frac{\pi}{6}}$

(3)　$-5-j5\sqrt{3} = 10e^{-j\frac{2\pi}{3}}$

(4)　$j4 = 4e^{j\frac{\pi}{2}}$

(5)　$-j4 = 4e^{-j\frac{\pi}{2}}$

(6)　$2\sqrt{3} = 2\sqrt{3}e^{j0}$

(7)　$-2\sqrt{3} = 2\sqrt{3}e^{j\pi}$

(8)　$2\sqrt{3}-j2 = 4e^{-j\frac{\pi}{6}}$

(9)　$-3\sqrt{2}-j3\sqrt{2} = 6e^{-j\frac{3\pi}{4}}$

(10)　$-5\sqrt{3}+j5 = 10e^{j\frac{5\pi}{6}}$

(11)　$2+j2\sqrt{3} = 4e^{j\frac{\pi}{3}}$

(12)　$-2\sqrt{3}+j2 = 4e^{j\frac{5\pi}{6}}$

(13)　$-4-j4 = 4\sqrt{2}e^{-j\frac{3\pi}{4}}$

(14)　$3\sqrt{6}+j3\sqrt{2} = 6\sqrt{2}e^{j\frac{\pi}{6}}$

(15)　$2\sqrt{5}-j2\sqrt{5} = 2\sqrt{10}e^{-j\frac{\pi}{4}}$

(16)　$-5\sqrt{2}+j5\sqrt{6} = 10\sqrt{2}e^{j\frac{2\pi}{3}}$

(17)　$-\sqrt{2}-j\sqrt{6} = 2\sqrt{2}e^{-j\frac{2\pi}{3}}$

(18)　$-2\sqrt{15}+j2\sqrt{5} = 4\sqrt{5}e^{j\frac{5\pi}{6}}$

(19)　$\sqrt{8}-j\sqrt{24} = 4\sqrt{2}e^{-j\frac{\pi}{3}}$

(20)　$\sqrt{24}-j\sqrt{8} = 4\sqrt{2}e^{-j\frac{\pi}{6}}$

[問題は裏に続く]

2　次の極座標で表された複素数を直交座標で示せ.

例 $2\mathrm{e}^{\mathrm{j}\frac{\pi}{3}} = 1 + \mathrm{j}\sqrt{3}$

(1) $5\mathrm{e}^{\mathrm{j}\frac{\pi}{6}} = \dfrac{5\sqrt{3}}{2} + \mathrm{j}\dfrac{5}{2}$

(2) $4\mathrm{e}^{-\mathrm{j}\frac{2\pi}{3}} = -2 - \mathrm{j}2\sqrt{3}$

(3) $2\mathrm{e}^{\mathrm{j}\frac{\pi}{2}} = \mathrm{j}2$

(4) $2\mathrm{e}^{-\mathrm{j}\frac{\pi}{2}} = -\mathrm{j}2$

(5) $4\mathrm{e}^{-\mathrm{j}\pi} = -4$

(6) $5\mathrm{e}^{\mathrm{j}\frac{4\pi}{3}} = -\dfrac{5}{2} - \mathrm{j}\dfrac{5\sqrt{3}}{2}$

(7) $5\mathrm{e}^{-\mathrm{j}\frac{4\pi}{3}} = -\dfrac{5}{2} + \mathrm{j}\dfrac{5\sqrt{3}}{2}$

(8) $\sqrt{2}\mathrm{e}^{-\mathrm{j}\frac{\pi}{2}} = -\mathrm{j}\sqrt{2}$

(9) $\sqrt{2}\mathrm{e}^{-\mathrm{j}\frac{3\pi}{2}} = \mathrm{j}\sqrt{2}$

(10) $\sqrt{3}\mathrm{e}^{-\mathrm{j}\frac{3\pi}{4}} = -\dfrac{\sqrt{6}}{2} - \mathrm{j}\dfrac{\sqrt{6}}{2}$

(11) $2\mathrm{e}^{\mathrm{j}\frac{5\pi}{4}} = -\sqrt{2} - \mathrm{j}\sqrt{2}$

(12) $10\mathrm{e}^{\mathrm{j}\frac{5\pi}{3}} = 5 - \mathrm{j}5\sqrt{3}$

(13) $\sqrt{2}\mathrm{e}^{-\mathrm{j}\frac{5\pi}{6}} = -\dfrac{\sqrt{6}}{2} - \mathrm{j}\dfrac{\sqrt{2}}{2}$

(14) $\sqrt{6}\mathrm{e}^{-\mathrm{j}\frac{\pi}{4}} = \sqrt{3} - \mathrm{j}\sqrt{3}$

(15) $2\mathrm{e}^{-\mathrm{j}\pi} = -2$

(16) $5\mathrm{e}^{\mathrm{j}\frac{\pi}{2}} = \mathrm{j}5$

(17) $5\mathrm{e}^{-\mathrm{j}\frac{\pi}{2}} = -\mathrm{j}5$

(18) $5\mathrm{e}^{\mathrm{j}\frac{3\pi}{2}} = -\mathrm{j}5$

(19) $\sqrt{8}\mathrm{e}^{\mathrm{j}\frac{4\pi}{3}} = -\sqrt{2} - \mathrm{j}\sqrt{6}$

(20) $\sqrt{8}\mathrm{e}^{-\mathrm{j}\frac{7\pi}{4}} = 2 + \mathrm{j}2$

[問題は以上です, しっかり見直しを]