

⑦ P30

$$\text{点 } w \text{ について } |w| = 2 \quad \dots \textcircled{1}$$

$$w = \frac{z-4}{z+2} \quad \text{より } \textcircled{1} \text{ に代入して}$$

$$\left| \frac{z-4}{z+2} \right| = 2$$

$$\left| \frac{\alpha}{\beta} \right| = \frac{|\alpha|}{|\beta|}$$

$$\frac{|z-4|}{|z+2|} = 2$$

$$|z-4| = 2|z+2|$$

両辺を2乗して

$$|z-4|^2 = 4|z+2|^2$$

$$(z-4)(\bar{z}-4) = 4(z+2)(\bar{z}+2)$$

$$(z-4)(\bar{z}-4) = 4(z+2)(\bar{z}+2)$$

$$(z-4)(\bar{z}-4) = 4(z+2)(\bar{z}+2)$$

$$z\bar{z} - 4z - 4\bar{z} + 16$$

$$= 4(z\bar{z} + 2z + 2\bar{z} + 4)$$

$$4z\bar{z} + 8z + 8\bar{z} + 16$$

$$= z\bar{z} - 4z - 4\bar{z} + 16$$

$$3z\bar{z} + 12z + 12\bar{z} = 0$$

$$z\bar{z} + 4z + 4\bar{z} = 0$$

$$z(\bar{z}+4) + 4\bar{z} = 0 \quad -4\bar{z} = 0$$

$$z(\bar{z}+4) + 4(\bar{z}+4) - 16 = 0$$

$$(z+4)(\bar{z}+4) = 16$$

$$(z+4)(\bar{z}+4) = 16$$

$$(z+4)(\overline{z+4}) = 16$$

$$|z+4|^2 = 16$$

$$|z+4|^2 = 4^2$$

$$|z+4| = 4$$

∴ 点 z の全解は、点 -4 を中心とした
半径 4 の円

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$$z\bar{z} = |z|^2$$

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$$\overline{\alpha - \beta} = \bar{\alpha} - \bar{\beta}$$

$$\overline{\alpha + \beta} = \bar{\alpha} + \bar{\beta}$$