Panel 1

Complex Analysis

HW #2

① Locate z_1+z_2 and z_1-z_2 vectorially where

a) $z_1 = 2i$, $z_2 = 1-i$ b) $z_1 = (-3,1)$, $z_2 = (1,4)$

② Sketch the set of points for which

a) $|z-(1+i)| = 1$ b) $|z+i| \le 3$

③ Prove that $\sqrt{2}\,|z| \ge |\mathrm{Re}(z)| + |\mathrm{Im}(z)|$

(Hint: reduce inequality to $(|x|-|y|)^2 \ge 0$)

④ Simplify a) $\overline{\bar{z}+3i}$ b) $\overline{(2+i)^2}$

⑤ Show that the equation of a circle $|z-z_0| = R$ can be written as $|z|^2 - 2\mathrm{Re}(z\bar{z}_0) + |z_0|^2 = R^2$

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Panel 2

⑥ Find a) $\arg(1-i)$ b) $3e^{i\frac{3\pi}{2}}$

⑦ Find principle angle $\mathrm{Arg}(z)$ for

a) $z = \frac{0}{-2-2i}$ b) $z = (\sqrt{3}-i)^6$

⑧ Show that $(-1+i)^7 = -8(1+i)$

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