

Panel 1

Complex Analysis

HW #2① locate z_1, z_2 and $z_1 - z_2$ graphically, 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) $|z+i| \leq 3$

③ Simplify a) $\overline{z+3i}$ b) $\overline{(2+i)^2}$ ④ Show that the equation of a circle $|z - z_0| = R$ can be written as $|z|^2 - 2\operatorname{Re}(z\bar{z}_0) + |z_0|^2 = R^2$

Panel 2

⑤ Find a) $\operatorname{arg}(1-i)$ b) $3e^{i\frac{3\pi}{2}}$ ⑥ Find principle angle $\operatorname{Arg}(z)$ for

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

⑦ Show that $(-1+i)^7 = -8(1+i)$ ⑧ (Extra credit) Find the four 4-th roots of -1 , i.e.
 $\sqrt[4]{-1}$