Exercise 1
Find $zw$, $z/w$, $z^{-101}$, for
(i) $z = 1 + i$, $w = 3i + 3$.
(ii) $z = -i$, $w = -2i$.

Exercise 2
Find $\log z$, $\operatorname{Log} z$ and $\sqrt{z}$ for
(i) $z = 2i$;
(ii) $z = 1 - i$;
(iii) $z = 2/(1 - \sqrt{3}i)$.

Exercise 3
Prove:
(i) $\text{Im}(iz) = \text{Re} z$, $\text{Re}(iz) = -\text{Im} z$;
(ii) $\log \bar{z} = \log z$, $e^{\bar{z}} = \bar{e^z}$;
(iii) $\cos \bar{z} = \overline{\cos z}$, $\sin \bar{z} = \overline{\sin z}$.

Exercise 4
(i) Show that $\log(z_1z_2) = \log z_1 + \log z_2$ as sets.
(ii) Show that $\operatorname{Log}(z_1z_2) = \operatorname{Log} z_1 + \operatorname{Log} z_2$ provided $-\pi < \arg z_1 + \arg z_2 < \pi$.
(iii) Give an example of $z_1$, $z_2$ with $\operatorname{Log}(z_1z_2) \neq \operatorname{Log} z_1 + \operatorname{Log} z_2$.

Exercise 5
Sketch the set of points give by the condition:
(i) $0 < |z| < 1$;
(ii) $1 < |2z + i| < 2$;
(iii) $\text{Re}((1 + i)\bar{z}) \geq -1$. 