

**Exercise 2**

Show that

$$(a) \operatorname{Re}(iz) = -\operatorname{Im} z; \quad (b) \operatorname{Im}(iz) = \operatorname{Re} z.$$

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**Solution****Part (a)**

$$\begin{aligned} \operatorname{Re}(iz) &= \operatorname{Re}[i(x + iy)] \\ &= \operatorname{Re}(ix + i^2y) \\ &= \operatorname{Re}(-y + ix) \\ &= -y \\ &= -\operatorname{Im}(x + iy) \\ &= -\operatorname{Im} z \end{aligned}$$

**Part (b)**

$$\begin{aligned} \operatorname{Im}(iz) &= \operatorname{Im}[i(x + iy)] \\ &= \operatorname{Im}(ix + i^2y) \\ &= \operatorname{Im}(-y + ix) \\ &= x \\ &= \operatorname{Re}(x + iy) \\ &= \operatorname{Re} z \end{aligned}$$