It is given that $z = -\sqrt{3} + \mathrm{i}$.

(a) Express z^2 in the form $re^{i\theta}$, where $r > 0$ and $-\pi < \theta \leqslant \pi$. [3]

(b) The complex number ω is such that $z^2\omega$ is real and $\left|\frac{z^2}{\omega}\right| = 12$.

Find the two possible values of ω, giving your answers in the form $Re^{i\alpha}$, where $R > 0$ and $-\pi < \alpha \leqslant \pi$. [3]