(1) Solve the following quadratic equation
$z^2 + (2i - 1)z - 2i = 0$.

(2) Let $P(z)$ be a polynomial with real coefficients.
Prove that if z_0 is a root of $P(z)$ then $\bar{z_0}$ is also a root of $P(z)$.

(3) Express the following number as $a + bi$ for some real a, b:

$$\frac{(3 - \sqrt{3}i)^{71}}{(1 - i)^{53}}$$

(4) Find all complex solutions of the following equation

$$x^6 + 7x^3 - 8 = 0$$

(5) Prove that for any complex numbers z_1, z_2, z_3 we have

$$(z_1 z_2)z_3 = z_1(z_2 z_3)$$

(6) Let $z = \frac{(1+3i)^{150}}{(2+2i)^{50}(3+4i)^{75}}$
Find $|z|$.