(1) Find all solutions of \( z^5 = 6i \).

(2) Find the real part of \((\cos{0.7} + i \sin{0.7})^{53}\).

(3) Find all complex numbers \( z \), in Cartesian (rectangular) form such that \((z - 1)^4 = -1\).

(4) Write \((\sqrt{3} + i)^{50}\) in polar and in Cartesian form.

(5) Find all fifth roots of \(-32\).

(6) Write the following in Cartesian form \( a + ib \) where \( a \) and \( b \) are real and simplified as much as possible:
   \[
   (a) \quad \frac{1}{1 + i} + \frac{1}{1 - i} \quad \quad (b) \quad e^{2 + i\pi/3}
   \]

(7) Write all solutions of \( z^3 = 8i \) in polar and Cartesian form, simplified as much as possible.

(8) Find all complex solutions of the equation \( z^5 = 1 + i \).

(9) Find the imaginary part of \( \frac{2 + i}{3 - i} \).

(10) Find the angle between 0 and \(2\pi\) that is an argument of \((1 - i)^{1999}\).

(11) Find all \( z \) such that \( e^{iz} = 3i \).

(12) Write \((1 - i)^{100}\) as \( a + ib \) with \( a \) and \( b \) real numbers and simplify your answer.

(13) Find the real part of \( e^{(5 + 12i)x} \) where \( x \) is real, and simplify your answer.

(14) Find all solutions to \( z^6 = 8 \) and plot them in the complex plane.

(15) Evaluate \( \sum_{n=0}^{\infty} \frac{\sin{n\theta}}{n!} \).

(16) For what \( \theta \) does \( \sum_{n=0}^{\infty} \frac{\cos{n\theta}}{2^n} \) converge? If it converges, what does it converge to?