Exercises with complex numbers

Laboratory 3 Phys 250 Sp2019

Problem 1

Find the magnitude of the following numbers

A. 1 + 2 i

B. 20 + 13 i

C. 20 e^{140i}

Problem 2 Write the following numbers in the form $re^{i\theta}$

A. 1 + 2 i

B. 20 + 13 i

C. 20 + 140 i

Problem 3 Write the following numbers in the form $a + ib$

A. 1 e^{2i}

B. 3 $e^{\pi i}$

C. 2 $e^{\frac{2\pi}{3}i}$

The numbers in the exponent are in radians.

Problem 4 Find the complex conjugate of

A. 1 + 2 i

B. 20 + 13 i

C. 20 e^{140i}

Problem 5 Draw a sketch of the complex plane showing where each number in problem 3 is on that plane.

Problem 6 Perform the following calculations with z_1 = 1 + 2 i, z_2 = -1 + 2 i, and z_3 = 1 + -2 i

A. $z_1 + z_2$

B. $z_1 * z_2$

C. $z_1^* * z_2$

D. $\frac{z_1 * z_2}{z_3}$

Problem 7 Show

A. $\cos(iz) = \cosh(iz)$

B. $\sin(iz) = \sinh(iz)$