

Solutions

Complex Number Exercises CS 145 Images and Imagination

- Put in z standard form ($a + b i$):
 - $z = 4 + \sqrt{9} = 7$
 - $z = i^2 + i\sqrt{25} = -1 + 5 i$
 - $z = 254 i^2 = -254$
 - $z = i^7 = -i$
- Convert from polar to standard form (Cartesian coordinates) in standard form
 - $r = 4, \theta = 25, z = 3.63 + 1.69 i$
 - $r = 5, \theta = 165, z = -4.83 + 1.29i$
- Compute the modulus (length) of
 - $z = 3 + 4i, r = 5$
 - $z = -2 + 1.6i, r = 2.56$
- What is the \bar{z} = complex conjugate of each of the z values in problem 1
 - $\bar{z} = 4 - 3 i$
 - $\bar{z} = -1 - 5 i$
 - $\bar{z} = -254$
 - $\bar{z} = i$
- Suppose $z_1 = (4 + 3 i)$ and $z_2 = (-2 + 4 i)$. Calculate the following, placing the result in standard form
 - $z_1 + z_2 = 2 + 7 i$
 - $z_1 - z_2 = 6 - i$
 - $2 z_1 = 8 + 6i$
 - $z_1 z_1 = z_1^2 = 7.0 + 24.0i$
 - $z_1 z_2 = -20 + 10 i$
 - $\bar{z}_1 + z_1 = 8$
 - $\bar{z}_1 z_1 = 25$
 - $z_1 / z_2 = .2 - 1.1 i$