

National Institute of Open Schooling
Senior Secondary Course: Mathematics
Lesson 8: Complex Numbers
Worksheet-8

1. Write any three complex numbers and find its complex conjugates.
2. Find the modules of the complex number
 $Z = 2 + 3i$. Also find the modules of $-Z$ and \bar{Z} . Observe the relationship among the modules of $Z, -Z$ and \bar{Z} .
3. By taking any two complex numbers Z_1 and Z_2 verify that $|Z_1 + Z_2| \leq |Z_1| + |Z_2|$
4. If Z_1 and Z_2 be the two complex numbers, show that addition of two complex numbers will be a complex number and addition of complex numbers is commutative.
5. By taking and three complex numbers Z_1, Z_2 and Z_3 , verify that
 $Z_1(Z_2 + Z_3) = Z_1 \cdot Z_2 + Z_1 \cdot Z_3$
6. If $(\cos \theta - i \sin \theta)^2 = x - iy$, prove that $x^2 + y^2 = 1$
7. If $a + ib = \frac{c+i}{c-i}$, where 'C' is a real number, prove that $\frac{a}{b} = \frac{c^2-1}{2c}$
8. Find the square root of $7 + 24i$
9. Find the conjugate of the following complex number.
 - (i) $\frac{1+i}{1-i}$
 - (ii) $\frac{(1+i)^2}{3-i}$
10. Express $5i^3 + 7i^{20} - 3i^2$ in the form of $a + bi$