



1	If $\left(\frac{1+i}{1-i}\right)^m = 1$, then find the least positive integral value of m.
2	Evaluate $(1+i)^4$
3	Find the modulus of $\frac{1+i}{1-i} - \frac{1-i}{1+i}$
4	Find the modulus of $\frac{(1+i)(2+i)}{3+i}$
5	Express in the form of a + ib. $(1+3i)^{-1}$
6	Find the conjugate of $\frac{1}{2-3i}$
7	Find the conjugate of $-3i - 5$.
8	Let $z_1 = 2 - i, z_2 = -2+i$ Find $\operatorname{Re}\left(\frac{z_1 z_2}{z_1}\right)$
9	If $x - iy = \sqrt{\frac{a-ib}{c-id}}$ Prove that $(x^2 + y^2)^2 = \frac{a^2 + b^2}{c^2 + d^2}$
10	Express in the form of a + ib $(3i-7) + (7-4i) - (6+3i) + i^{23}$
11	Find the conjugate of $\sqrt{-3} + 4i^2$
12	Find the value of $1+i^2 + i^4 + i^6 + i^8 + \dots + i^{20}$
13	Multiply $3-2i$ by its conjugate.
14	Find the modulus $i^{25} + (1+3i)^3$

15	If $a+ib = \frac{(x+i)^2}{2x^2+1}$ Prove that $a^2+b^2 = \frac{(x^2+1)^2}{(2x^2+1)^2}$
16	If $(x+iy)^3 = u+iv$ then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$
17	Find two numbers such that their sum is 6 and the product is 14.
18	Write the real and imaginary part $1 - 2i^2$
19	Find the conjugate and modulus of $\overline{9-i} + \overline{6+i^3} - \overline{9+i^2}$
20	If $x + iy = \sqrt{\frac{1+i}{1-i}}$, prove that $x^2 + y^2 = 1$



INDIAN SCHOOL AL WADI AL KABIR
DEPARTMENT OF MATHEMATICS 2023 – 2024
Work Sheet – Class XI

Complex Numbers and Quadratic Equations (Answer Key)

1	$m=4$
2	-4
3	2
4	1
5	$\frac{1}{-8} + \frac{3i}{8}$
6	$\bar{z} = \frac{2}{13} - \frac{3}{13}i$
7	$\bar{z} = 3i - 5$
8	$\operatorname{Re}\left(\frac{z_1 z_2}{\bar{z}_1}\right) = -\frac{2}{5}$
10	$-6 + (-5i)$
11	$\bar{z} = -\sqrt{3}i - 4$
12	$1 + i^2 + (i^2)^2 + (i^2)^3 + (i^2)^4 + \dots + (i^2)^{10} = 1$
13	$= 13$
14	$\sqrt{965}$
17	$3 - \sqrt{5}i \quad 3 + \sqrt{5}i$
18	$3 + 0.i$
19	$\sqrt{53}$