

J.E.E. Main/ Advanced Foundation - XI Maths Worksheet**Time: 60 min****Chapter#5. Complex Numbers and Quadratic Equations****Full Marks:**Q.1 Solve the equation $2x^2 + x + 1 = 0$. (2 marks)Q.2 Evaluate : $\left[i^{18} + \left(\frac{1}{i} \right)^{25} \right]$ Q.3 Convert the given complex number in polar form: -3 . (3 marks)Q.4 Express the given complex number in the form $a + ib$: $(1 - i) - (-1 + i6)$. (1 mark)Q.5 Express $(-\sqrt{3} + \sqrt{2})(2\sqrt{3} - i)$ in the form $a+ib$.Q.6 Evaluate: $(-\sqrt{-1})^{4n+3}$. (1 mark)Q.7 Express the given complex number in the form $a + ib$: $\left(\frac{1}{3} + 3i \right)^3$. (3 marks)Q.8 Find the multiplicative inverse of the complex number $\sqrt{5} + 3i$. (2 marks)Q.9 Express the given complex number in the form $a + ib$: $(1 - i)^4$. (2 marks)Q.10 Find the multiplicative inverse of the complex number $-i$. (1 mark)Q.11 If $x - iy = \sqrt{\frac{a - ib}{c - id}}$, then prove that $(x^2 + y^2)^2 = \frac{a^2 + b^2}{c^2 + d^2}$. (5 marks)Q.12 Convert the complex number $z = \frac{i-1}{\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}}$ in the polar formQ.13 Solve : $x^2 + 2 = 0$ Q.14 Solve $4x^2 - 25i^2 = 0$. (1 mark)Q.15 Find the argument of $1 + \sqrt{3}i$. (1 mark)Q.16 Express $\left[\left(\frac{1}{3} + i \frac{7}{3} \right) + \left(4 + i \frac{1}{3} \right) \right]$ in the form $a+bi$.Q.17 Express $i^9 + i^{10} + i^{11} + i^{12}$ in the form $a + bi$.Q.18 Express : $i^9 + i^{19}$ in the form $a+bi$.Q.19 Solve the quadratic equation $25x^2 - 30x + 11 = 0$. (2 marks)Q.20 Write the conjugate of complex number $-5 + 3i$. (1 mark)