

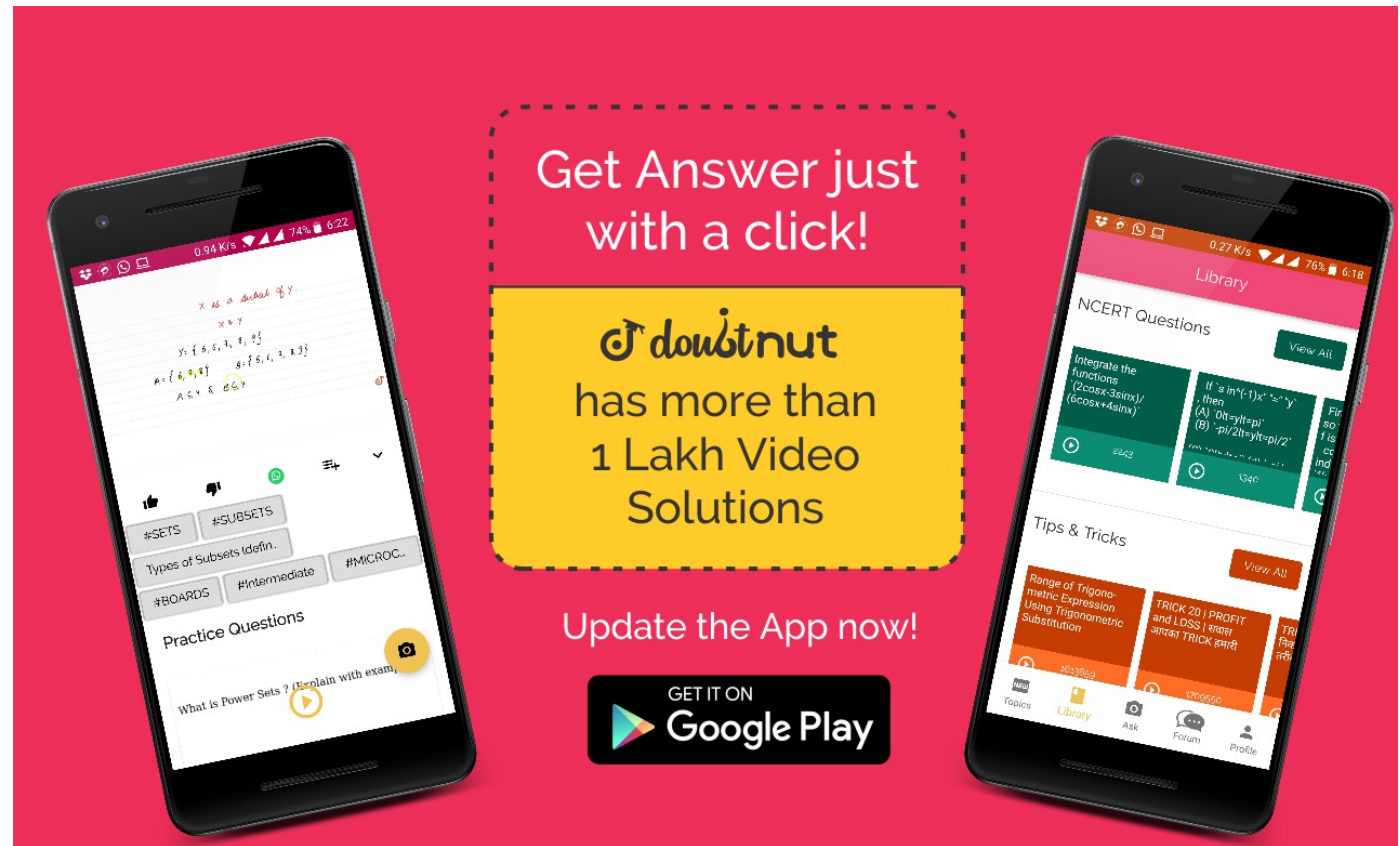
NCERT MATHS SOLUTIONS



Class - 11 || COMPLEX NUMBERS AND QUADRATIC EQUATIONS

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Ques No.	Question
1	<p>NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 1</p> <p>Express of the complex number in the form $a + ib \cdot (5i) \left(-\frac{3}{5}i \right)$</p> <p>▶ Watch Free Video Solution on Doubtnut</p>
2	<p>NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 2</p> <p>Express of the complex number in the form $a + ib \cdot i + i$</p> <p>▶ Watch Free Video Solution on Doubtnut</p>
3	<p>NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 3</p> <p>Express of the complex number in the form $a + ib \cdot i^{-}$</p> <p>▶ Watch Free Video Solution on Doubtnut</p>
4	<p>NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 4</p> <p>Express of the complex number in the form $a + ib \cdot$</p> $3(7 + i7) + i(7 + i7)$ <p>▶ Watch Free Video Solution on Doubtnut</p>
5	<p>NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 5</p> <p>Express of the complex number in the form $a + ib \cdot$</p> $(1 - i) - (-1 + i6)$



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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 6

Express of the complex number in the form $a + ib$.

$$\left(\frac{1}{5} + i\frac{2}{5}\right) - \left(4 + i\frac{5}{2}\right)$$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 7

Express of the complex number in the form $a + ib$. $[(1/3+i7/3)+(4+i1/3)]-(-4/3+i)$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 8

Express of the complex number in the form $a + ib$. $(1 - i)^4$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 9

Express of the complex number in the form $a + ib$. $\left(\frac{1}{3} + 3i\right)^3$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 10

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Express of the complex number in the form $a + ib$. $\left(-2 - \frac{1}{3}i\right)^3$

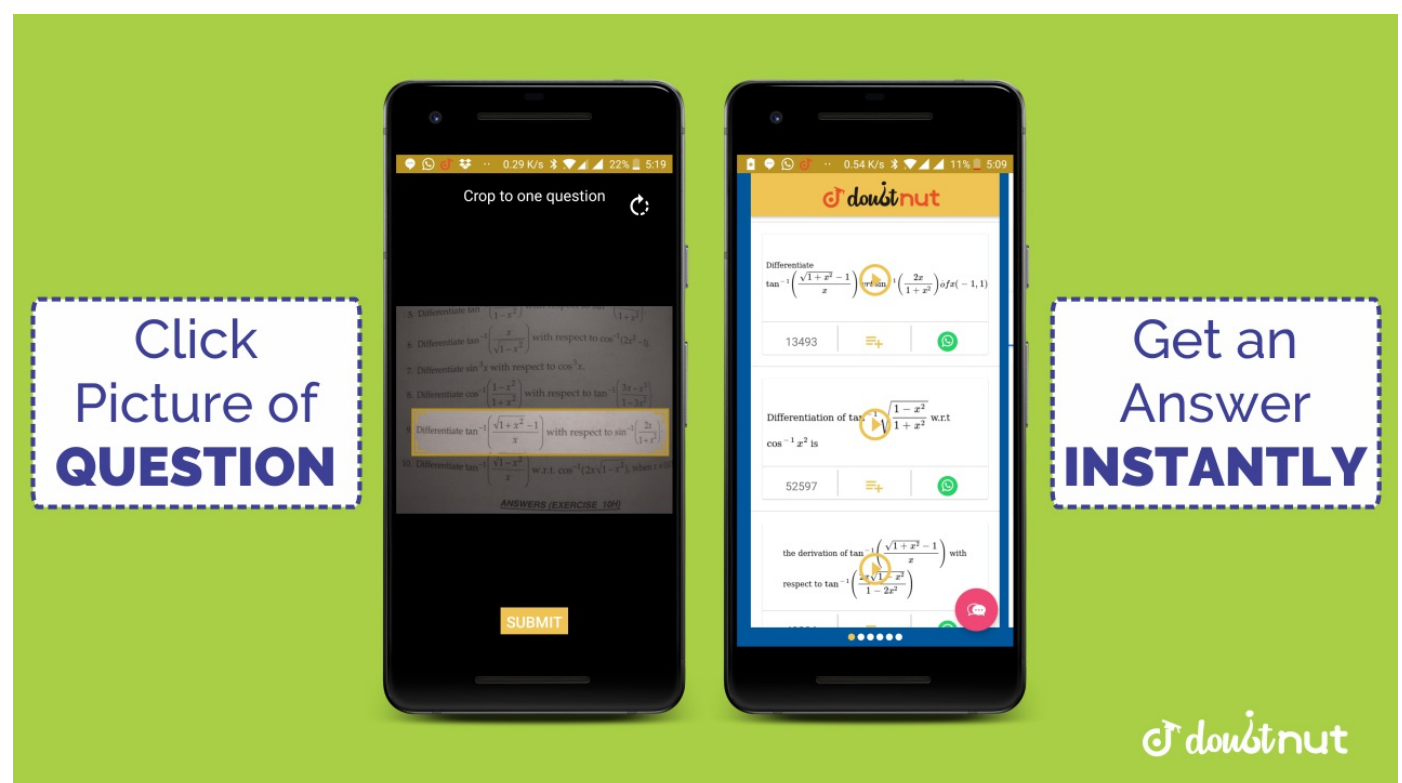
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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 11

11

Find the multiplicative inverse of the complex number $4 - 3i$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.1 - Q 12

12

Find the multiplicative inverse of the complex number $\sqrt{5} + 3i$

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13

Find the multiplicative inverse of the complex number i

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14

Express the following expression in the form of $a + ib$

$$\frac{(3 + i\sqrt{5})(3 - i\sqrt{5})}{(\sqrt{3} + \sqrt{2}i) - (\sqrt{3} - i\sqrt{2})}$$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.2 - Q 1

Find the modulus and the arguments of the complex number

$$z = 1 - i\sqrt{3}$$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.2 - Q 2

Find the modulus and the arguments of the complex number $z = -\sqrt{3} + i$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.2 - Q 3

Convert of the complex number in the polar form: $1 - i$

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Convert of the complex number in the polar form: $-1 + i$ [▶ Watch Free Video Solution on Doubtnut](#)

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.2 - Q 5Convert of the complex number in the polar form: $-1 - i$ [▶ Watch Free Video Solution on Doubtnut](#)

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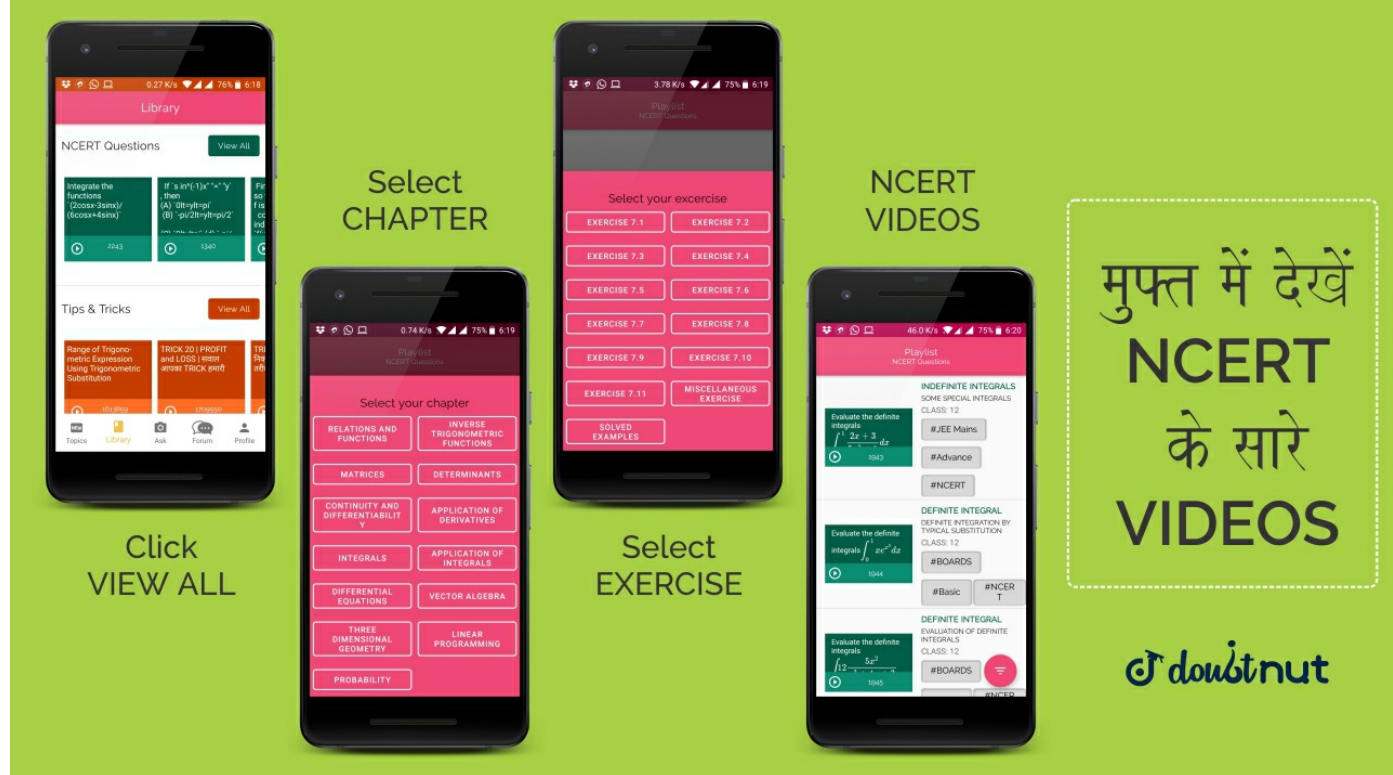
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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.3 - Q 1Solve the equation: $x^2 + 3 = 0$ [▶ Watch Free Video Solution on Doubtnut](#)



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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.3 - Q 2

Solve the equation: $2x^2 + x + 1 = 0$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.3 - Q 3

Solve the equation: $x^2 + 3x + 9 = 0$

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Solve the equation: $-x^2 + x - 2 = 0$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.3 - Q 5

Solve the equation: $x^2 + 3x + 5 = 0$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.3 - Q 6

Solve the equation: $x^2 - x + 2 = 0$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.3 - Q 7

Solve the equation: $\sqrt{2}x^2 + x + \sqrt{2} = 0$

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Solve the equation:
 $\sqrt{3}x^2 - \sqrt{2}x + 3\sqrt{3} = 0$

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Solve the equation:
 $x^2 + x + \frac{1}{\sqrt{2}} = 0$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.3 - Q 10

Solve the equation: $x^2 + \frac{x}{\sqrt{2}} + 1 = 0$

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Find the square roots of the following: $15 - 8i$ [▶ Watch Free Video Solution on Doubtnut](#)

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.4 - Q 2Find the square roots of the following: $8 - 6i$ [▶ Watch Free Video Solution on Doubtnut](#)

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.4 - Q 3Find the square roots of the following: $1 - i$ [▶ Watch Free Video Solution on Doubtnut](#)

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.4 - Q 4Find the square roots of the following: $-i$ [▶ Watch Free Video Solution on Doubtnut](#)

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.4 - Q 5Find the square roots of the following: i [▶ Watch Free Video Solution on Doubtnut](#)

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - EXERCISE 5.4 - Q 6Find the square roots of the following: $1 + i$ [▶ Watch Free Video Solution on Doubtnut](#)

NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 1

39

Evaluate : $\left[i^{18} + \left(\frac{1}{i} \right)^{25} \right]^3$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 2

40

For any two complex numbers z_1 and z_2 , prove that

$$\begin{aligned} & \operatorname{Re}(z_1 z_2) \\ &= \operatorname{Re} z_1 \operatorname{Re} z_2 \\ &- |m z_1| m z_2 \end{aligned}$$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 3

41

Reduce

$$\left(\frac{1}{1 - 4i} - \frac{2}{1 + i} \right) \left(\frac{3 - 4i}{5 + i} \right)$$

to the standard form.

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 4

If

42

$$x = \frac{-iy}{c - id}$$

$$= \sqrt{\frac{a - ib}{c - id}}$$

prove that $x^2 + y^2 = \frac{a^2 + b^2}{c^2 + d^2}$

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Convert the following in the polar form : (i) $\frac{1 + 7i}{(2 - i)^2}$ (ii) $\frac{1 + 3i}{1 - 2i}$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 6

Solve the equation : $3x^2 - 4x + \frac{20}{3} = 0$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 7

Solve the equation : $x^2 - 2x + \frac{3}{2} = 0$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 8

Solve the equation : $27x^2 - 10x + 1 = 0$

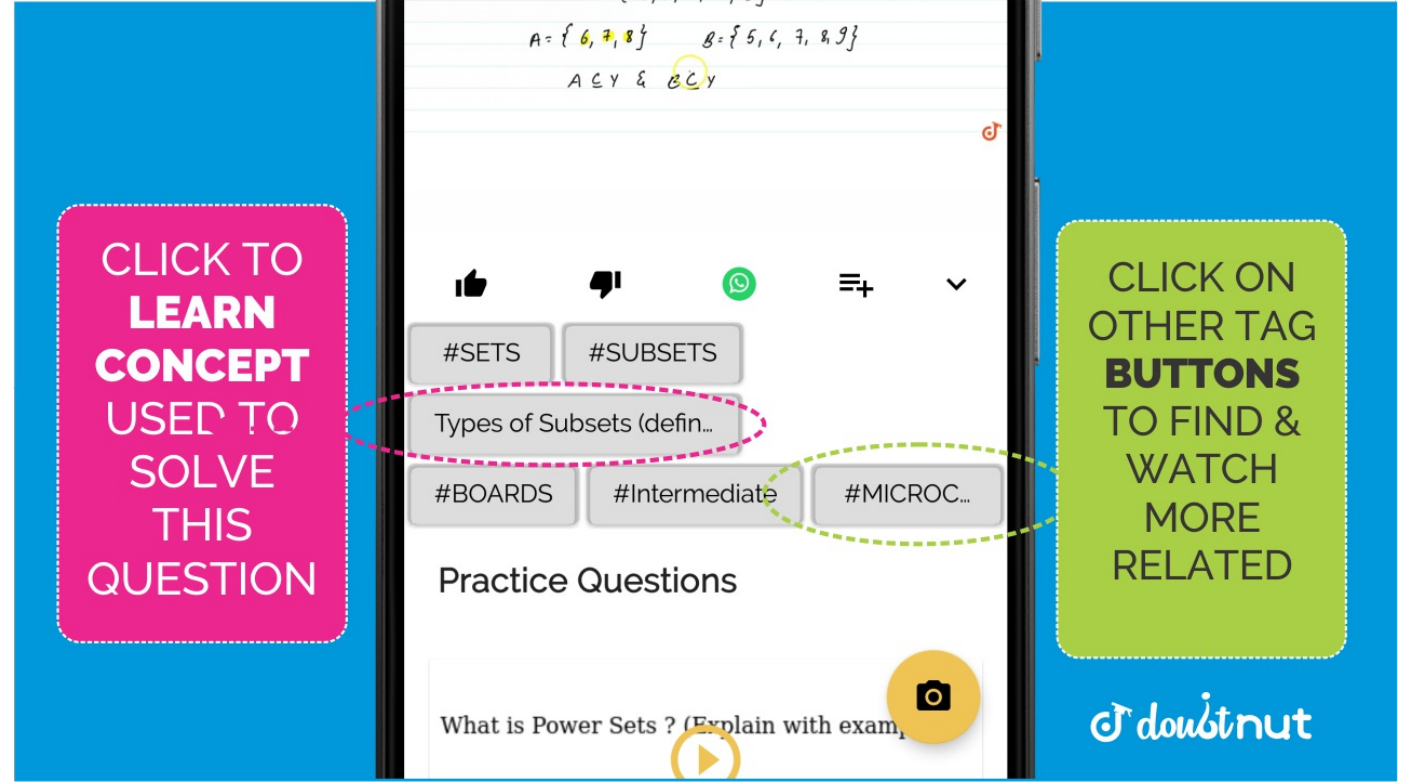
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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 9

Solve the equation :
 $21x^2 - 28x + 10$
 $= 0$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 10

If
 $z_1 = 2 - i, z_2 = 1 + i,$
 find $\left| \frac{z_1 + z_2 + 1}{z_1 - z_2 + i} \right|$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 11

If
 $a + ib = \frac{(x + i)^2}{2x^2 + 1},$
 prove that
 $a^2 + b^2 = \frac{(x^2 + 1)^2}{(2x^2 + 1)^2}$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 12

Let
 $z_1 = 2 - i, z_2 = -2 + i$
 . Find (i) $\operatorname{Re} \left(\frac{z_1 z_2}{\bar{z}_1} \right)$ (ii) $\operatorname{Im} \left(\frac{1}{z_1 \bar{z}_1} \right)$

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EQUATIONS - MISCELLANEOUS EXERCISE - Q 13

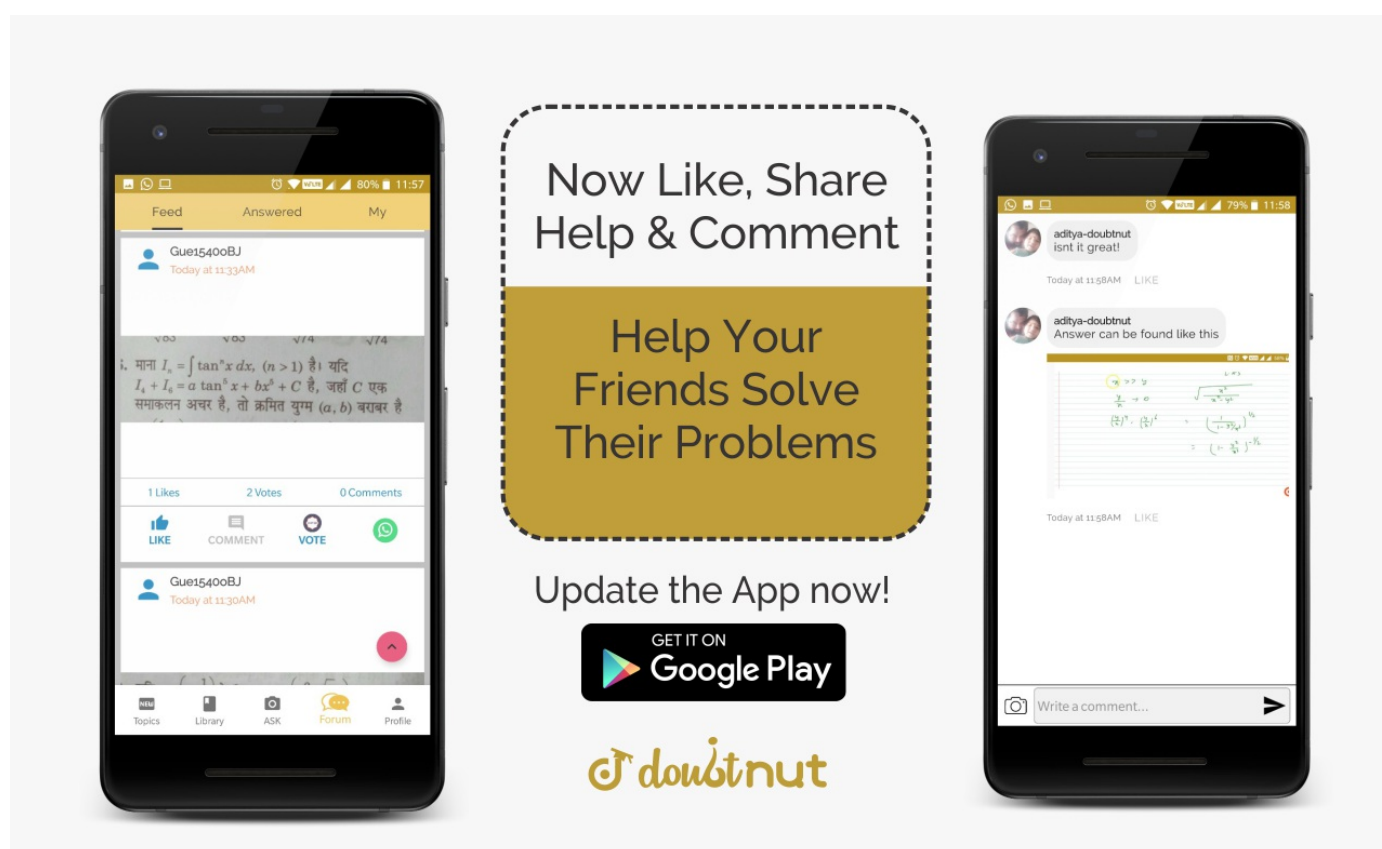
51

Find the modulus and argument of the complex number $\frac{1 + 2i}{1 - 3i}$.[▶ Watch Free Video Solution on Doubtnut](#)**NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 14**

52

Find the real numbers x and y if $(x - iy)(3 + 5i)$ is the conjugate of $-6 - 24i$.[▶ Watch Free Video Solution on Doubtnut](#)**NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 15**

53

Find the modulus of $\frac{1 + i}{1 - i} - \frac{1 - i}{1 + i}$.[▶ Watch Free Video Solution on Doubtnut](#)**NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 16**

54

If $(x + iy)^3 = u + iv$, then show that

$$\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$$
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55

If α and β are different complex numbers with $|\beta| = 1$, then find $\left| \frac{\beta - \alpha}{1 - \bar{\alpha}\beta} \right|$.

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Find the number of non-zero integral solutions of the equation $|1 - i|^x = 2^x$.

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 19

If
 $(a + ib)(c + id)(e + if)(g + ih) = A + iB$
 , then show that
 $(a^2 + b^2)(c^2 + d^2)(e^2 + f^2)(g^2 + h^2) = A^2 + B^2$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - MISCELLANEOUS EXERCISE - Q 20

If $\left(\frac{1 + i}{1 - i} \right)^m = 1$, then find the least integral value of m .

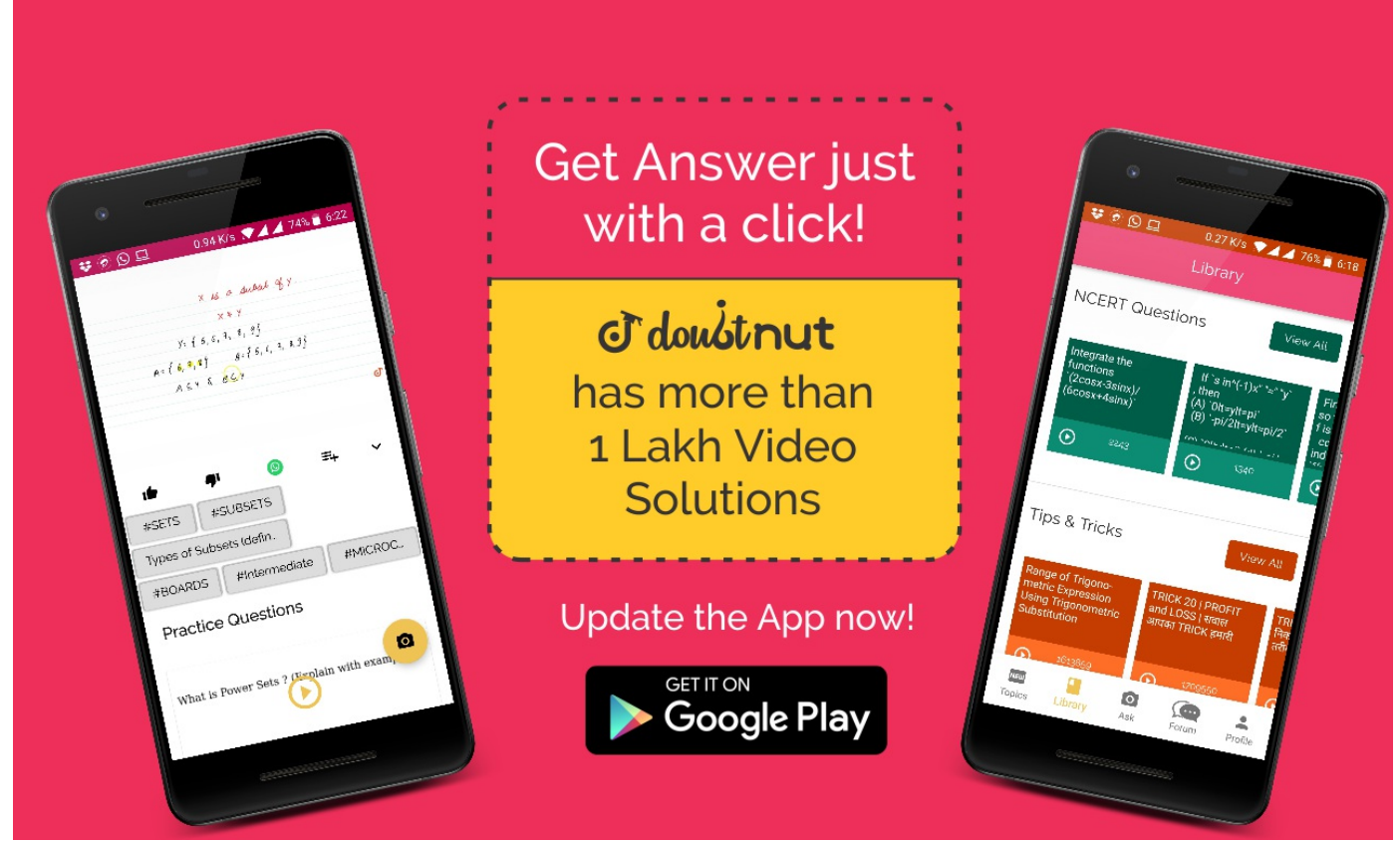
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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 1

If
 $4x + i(3x - y) = 3 + i(-6)$
 , where x and y are real numbers, then find the values of x and y .

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 2

60

Express the following in the form of $a + bi$: (i) $(-5i)\left(\frac{1}{8}i\right)$ (ii) $(-i)(2i)\left(-\frac{1}{8}i\right)^3$

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61

Express $(5 - 3i)^3$ in the form $a + ib$.

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62

Express $(-\sqrt{3} + \sqrt{-2})(2\sqrt{3} - i)$ in the form of $a + ib$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 5

63

Find the multiplicative inverse of $2 - 3i$.

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EQUATIONS - SOLVED EXAMPLES - Q 6

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Express the following in the form $a + ib$ (i) $\frac{5 + \sqrt{2}i}{1 - \sqrt{2}i}$ (ii) i^{-35}

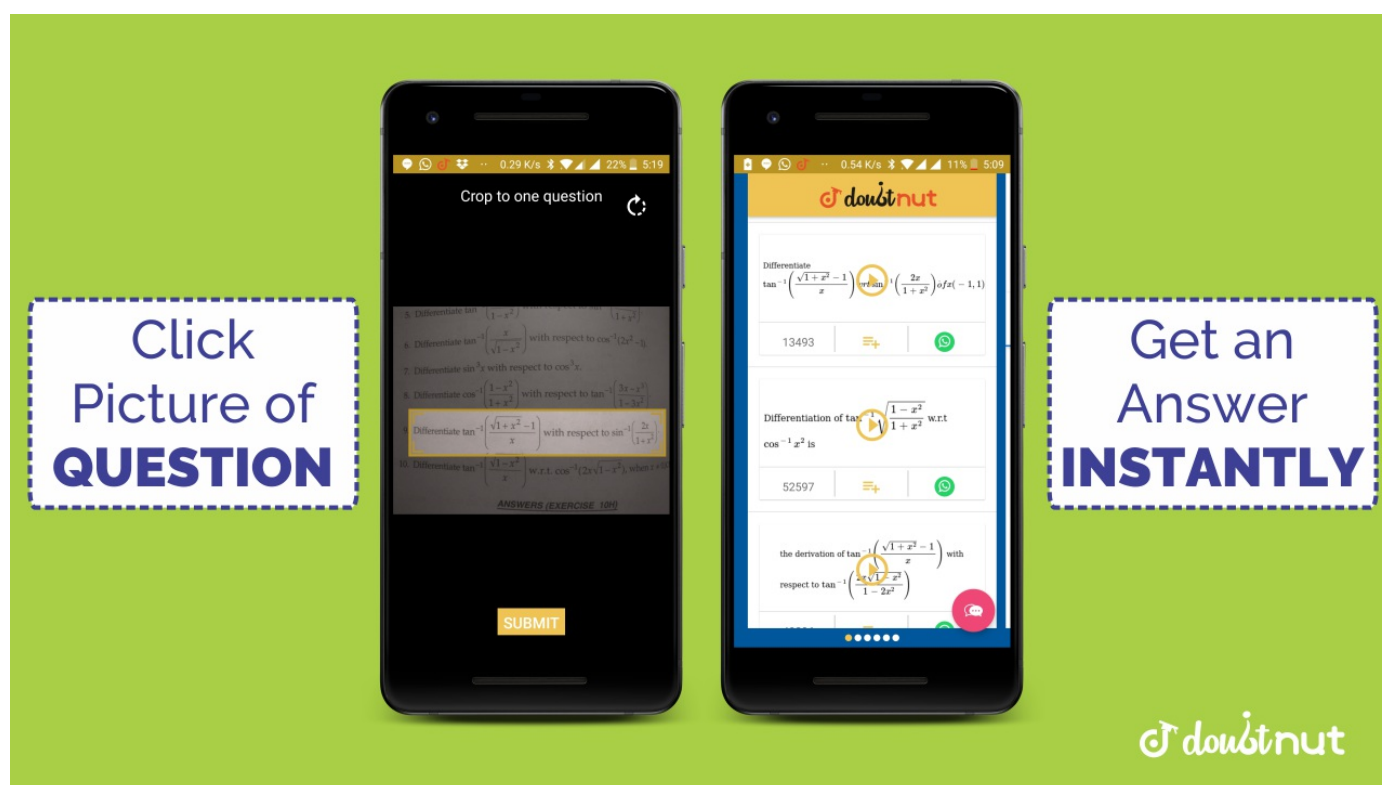
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65

Represent the complex number $z = 1 + i\sqrt{3}$ in the polar form.

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66

Convert the complex number $\frac{-16}{1 + i\sqrt{3}}$ into polar form.

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 9

67

Solve $x^2 + 2 = 0$.

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 10

68

Solve $x^2 + x + 1 = 0$.

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69

Solve $\sqrt{5}x^2 + x + \sqrt{5} = 0$.

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 12

70

Find the conjugate of $\frac{(3 - 2i)(2 + 3i)}{(1 + 2i)(2 - i)}$.

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71

Find the modulus and argument of the complex numbers : (i) $\frac{1 + i}{1 - i}$ (ii) $\frac{1}{1 + i}$

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 14

72

If $x + iy = \frac{a + ib}{a - ib}$,
 prove that $x^2 + y^2 = 1$.

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 15

Find real θ such that $\frac{3 + 2i \sin \theta}{1 - 2i \sin \theta}$ is purely real.

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 16

Convert the complex number $z = \frac{i - 1}{\frac{\cos \pi}{3} + i \frac{\sin \pi}{3}}$ in the polar form.

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NCERT - CLASS 11 - CHAPTER 5 COMPLEX NUMBERS AND QUADRATIC EQUATIONS - SOLVED EXAMPLES - Q 17

Find the square root of $-7 - 24i$

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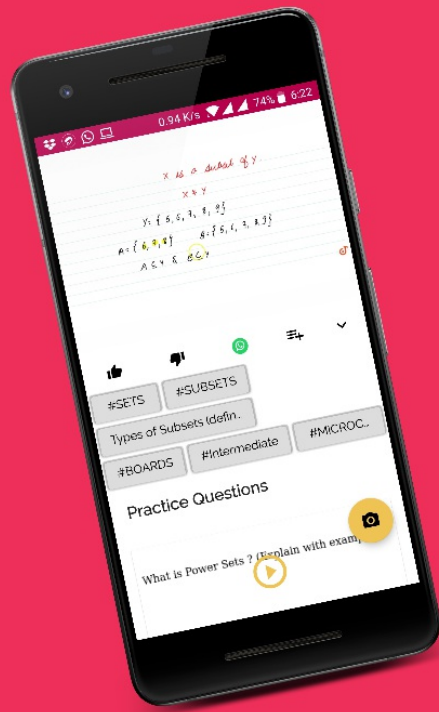
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