| Ques No. | Question |
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| 1 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.1 - Q 1**<br><br>Which of the following sentences are statements? Give reasons for your answer. (i) There are 35 days in a month. (ii) Mathematics is difficult. (iii) The sum of 5 and 7 is greater than 10. (iv) The square of a number is an even number. (v)<br><br>▶ Watch Free Video Solution on Doubtnut |
| 2 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.1 - Q 2**<br><br>Give three examples of sentences which are not statements. Give reasons for the answers.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 3 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.2 - Q 1**<br><br>Write the negation of the following statements: (i) Chennai is the capital of Tamil Nadu, (ii) $\sqrt{2}$ is not a complex number (iii) All triangles are not equilateral triangle. (iv) The number 2 is greater than 7. (v) Every natural number is<br><br>▶ Watch Free Video Solution on Doubtnut |
| 4 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.2 - Q 2**<br><br>Are the following pairs of statements negations of each other: (i)      The number x is not a rational number.      The number x is not an irrational number. (ii)      The number x is a rational number.      The number x is an irrational number.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 5 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.2 - Q 3**<br><br>Find the component statements of the following compound statements and check whether they are true or false. (i)    Number 3 is prime or it is odd. (ii)    All integers are positive or negative. (iii)   100 is divisible by 3, 11 and 5.<br><br>▶ Watch Free Video Solution on Doubtnut |
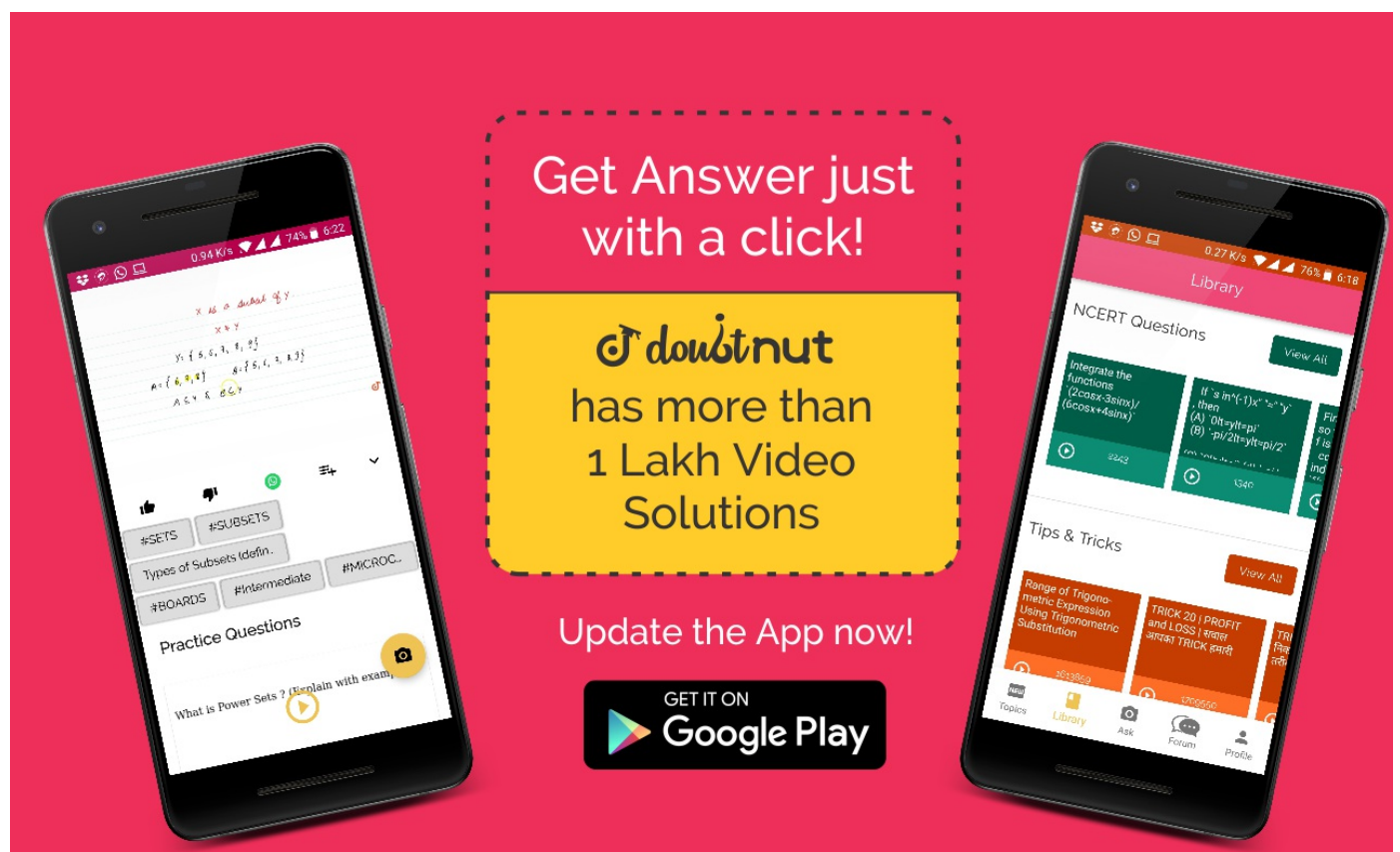
**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.3 - Q 1**

For each of the following compound statements first identify the connecting words and then break it into component statements. (i) All rational numbers are real and all real numbers are not complex. (ii) Square of an integer is positive or negati

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**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.3 - Q 2**

Identify the quantifier in the following statements and write the negation of the statements. (i) There exists a number which is equal to its square. (ii) For every real number x, x is less than $x + 1$. (iii) There exists a capital for every state in india.

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**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.3 - Q 3**

Check whether the following pair of statements are negation of each other. Give reasons for your answer. (i)
$x + y = y + x$
is true for every real numbers x and y. (ii) There exists real numbers x and y for which `x" "+" "y" "=" "y" "+" "`

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**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE**

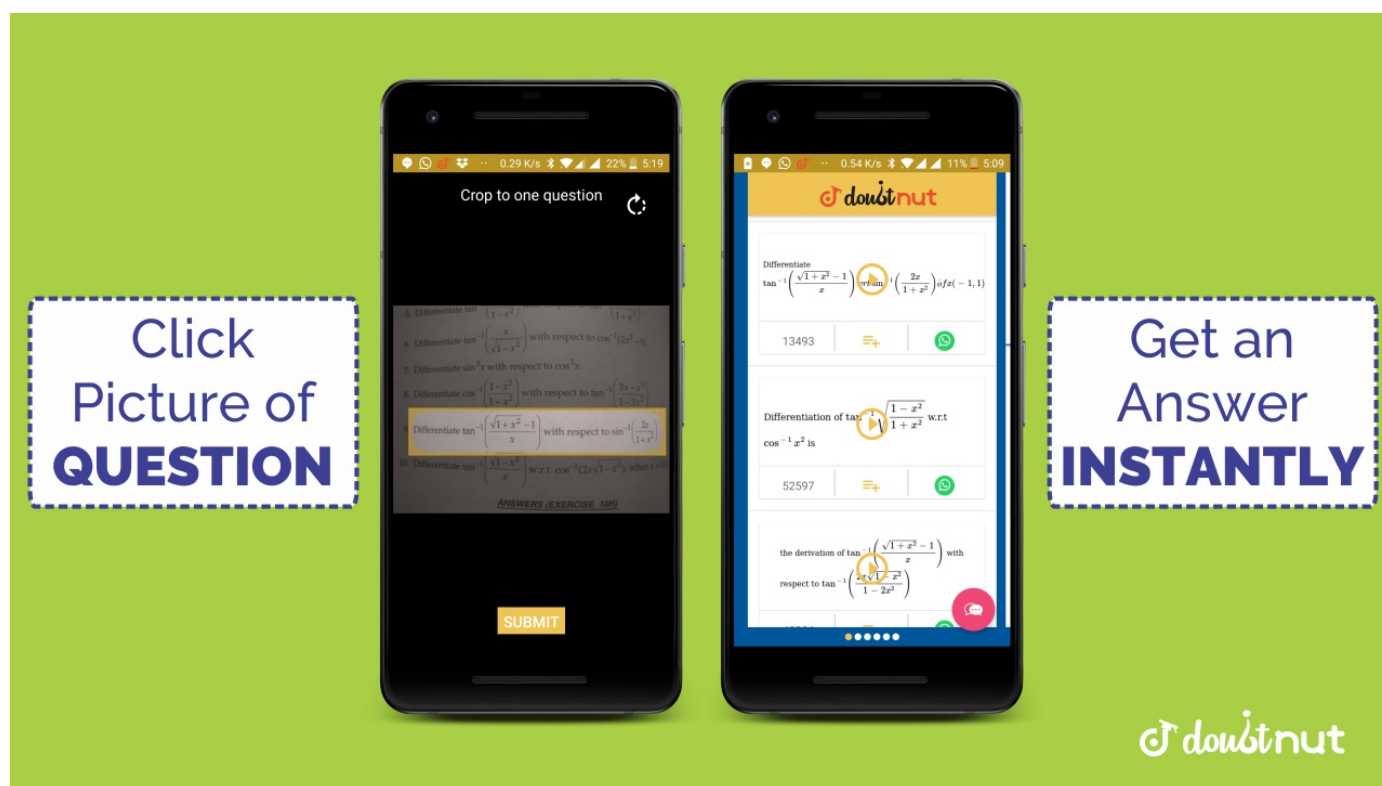| | |
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| 9 | **14.3 - Q 4**<br><br>State whether the "Or" used in the following statements is "exclusive "of' inclusive. Give reasons for your answer. (i) Sun rises or Moon sets. (ii) To apply for a driving license, you should have a ration card or a passport. (iii) All integers are positive or negative.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 10 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.4 - Q 1**<br><br>Rewrite the following statement with "if-then" in five different ways conveying the same meaning. If a natural number is odd, then its square is also odd.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 11 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.4 - Q 2**<br><br>Write the contrapositive and converse of the following statements. (i) If x is a prime number, then x is odd. (ii) If the two lines are parallel, then they do not intersect in the same plane, (iii) Something is cold implies that it has low temperature. (iv) You cannot comprehend geometry if you do not know how to reason deductively. (v) x is an even number implies that x is divisible by 4.<br><br>▶ Watch Free Video Solution on Doubtnut |
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| 12 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.4 - Q 3**<br><br>Write each of the following statements in the form "if-then' (i) You get a job implies that your credentials are good. (ii) The Banana trees will bloom if it stays warm for a month. (iii) A quadrilateral is a parallelogram if its diagonals bisect each other. (iv) To get an A" in the class, it is necessary that you do all the exercises the book.<br><br>▶ Watch Free Video Solution on Doubtnut |
| | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.4 - Q 4** |

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| 13 | Given statements in (a) and (b). Identify the statements given below as contrapositive or converse of each other. (a) If you live in Delhi, then you have winter clothes. (i) If you do not have winter clothes, then you do not live in Delhi. (ii) If you have winter clothes, then you live in Delhi. (b) If a quadrilateral is a parallelogram, then its diagonals bisect each other. (i) If the diagonals of a quadrilateral do not bisect each other, then the quadrilateral is not a parallelogram. (ii) If the diagonals of a quadrilateral bisect each other, then it is a parallelogram.<br><br> ▶ Watch Free Video Solution on Doubtnut |
| 14 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.5 - Q 1**<br><br>Show that the statement p: "If x is a real number such that $x^3 + 4x = 0$. then x is 0" is true by (i) direct method, (ii) method of contradiction, (iii) method of contrapositive.<br><br> ▶ Watch Free Video Solution on Doubtnut |
| 15 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.5 - Q 2**<br><br>Show that the statement "For any real numbers a and b, $a^2 = b^2$ implies that $a = b$ is not true by giving a counter-example.<br><br> ▶ Watch Free Video Solution on Doubtnut |
| 16 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.5 - Q 3**<br><br>Show that the following statement is true by the method of contrapositive. p: If x is an integer and $x^2$ is even, then x is also even.<br><br> ▶ Watch Free Video Solution on Doubtnut |
| 17 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.5 - Q 4**<br><br>By giving a counter example, show that the following statements are not true. (i) p: If all the angles of a triangle are equal, then the triangle is an obtuse angled triangle. (ii) q: The equation $x^2 - 1 = 0$ does not have a root lying between 0<br><br> ▶ Watch Free Video Solution on Doubtnut |
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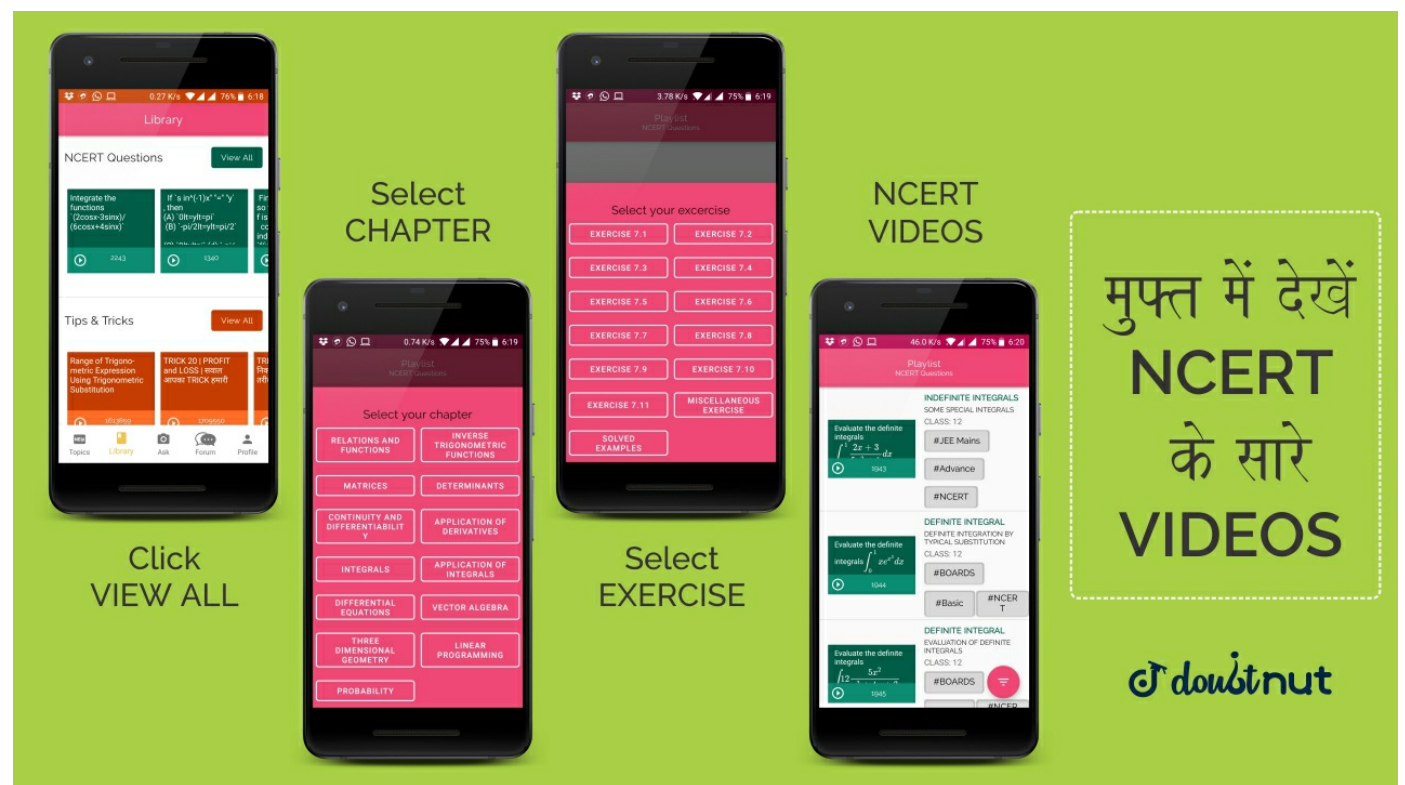| | |
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| 18 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - EXERCISE 14.5 - Q 5**<br><br>Which of the following statements are true and which are false? In each case give a valid reason for saying so. (i) p : Each radius of a circle is a chord of the circle. (ii) q : The centre of a circle bisects each chord of the circle, (iii)r: Circle is a aprticular case of an ellipse, (iv) s : If x an y are integerss such that $x > y$, (v) t : $\sqrt{11}$ is a rational number.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 19 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - MISCELLANEOUS EXERCISE - Q 1**<br><br>Write the negation of the following statements: (i) p : For every positive real number x, the number $x - 1$ is also positive. (ii) q : All cats scratch. (iii) r : For every real number x, either $x > 1$ or $x < 1$ . (iv) s : There exist<br><br>▶ Watch Free Video Solution on Doubtnut |
| 20 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - MISCELLANEOUS EXERCISE - Q 2**<br><br>State the converse and contrapositive of each of the following statements: (i)      p : A positive integer is prime only if it has no divisors other than 1 and itself. (ii)      q : I go to a beach whenever it is a sunny day. (iii)      r : If it is hot outside, then you feel thirsty.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 21 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - MISCELLANEOUS EXERCISE - Q 3**<br><br>Write each of the statements in the form "if p, then q" (i)      p : It is necessary to have a password to log on to the server. (ii)      q : There is traffic jam whenever it rains. (iii)      r : You can access the website only if you pay a subscription fee.<br><br>▶ Watch Free Video Solution on Doubtnut |

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| 22 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - MISCELLANEOUS EXERCISE - Q 4**<br><br>Rewrite each of the following statements in the form "p if and only if q" (i)    p: If you watch television, then your mind is free and if your mind is free, then you watch television. (ii)    q: For you to get an A grade, it is necessary and sufficient that you do all the homework regularly. (iii)    r : If a quadrilateral is equiangular, then it is a rectangle and if a quadrilateral is a rectangle, then it is equiangular.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 23 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - MISCELLANEOUS EXERCISE - Q 5**<br><br>Given below are two statements p : 25 is a multiple of 5. q : 25 is a multiple of 8. Write the compound statements connecting these two statements with 'And" and "Or". In both cases check the validity of the compound statement.<br><br>▶ Watch Free Video Solution on Doubtnut |
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| 24 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - MISCELLANEOUS EXERCISE - Q 6**<br><br>Check the validity of the statements given below by the method given against it. (i) p: The sum of an irrational number and a rational number is irrational (by contradiction method). (ii) q: If n is a real number with $n > 3$, then `n^2>9`<br><br>▶ Watch Free Video Solution on Doubtnut |
| 25 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - MISCELLANEOUS EXERCISE - Q 7**<br><br>Write the following statement in five different ways, conveying the same meaning. p: If a mangle is equiangular, then it is an obtuse angled triangle.<br><br>▶ Watch Free Video Solution on Doubtnut |
| | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 1** |

| 26 | Check whether the following sentences are statements. Give reasons for your answer. (i) 8 is less than 6. (ii) Every set is a finite set. (iii) The sun is a star. (iv) Mathematics is fun. (v) There is no rain without clouds. (vi) How far is Chennai from here?

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| 27 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 2**

Write the negation of the following statements. (i) Both the diagonals of a rectangle have the same length. (ii) $\sqrt{2}$ is rational.

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| 28 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 3**

Write the negation of the following statements and check whether the resulting statements are true, (i) Australia is a continent. (ii) There does not exist a quadrilateral which has all its sides equal, (iii) Every natural number is greater than 0. (iv) The sum of 3 and 4 is 9.

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| 29 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 4**

Find the component statements of the following compound statements. (i) The sky is blue and the grass is green. (ii) It is raining and it is cold. (iii) All rational numbers are real and all real numbers are complex. (iv) 0 is a positive number or a negative number.

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| 30 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 5**

Find the component statements of the following and check whether they are true or not. (i) A square is a quadrilateral and its four sides equal (ii) All prune numbers are |

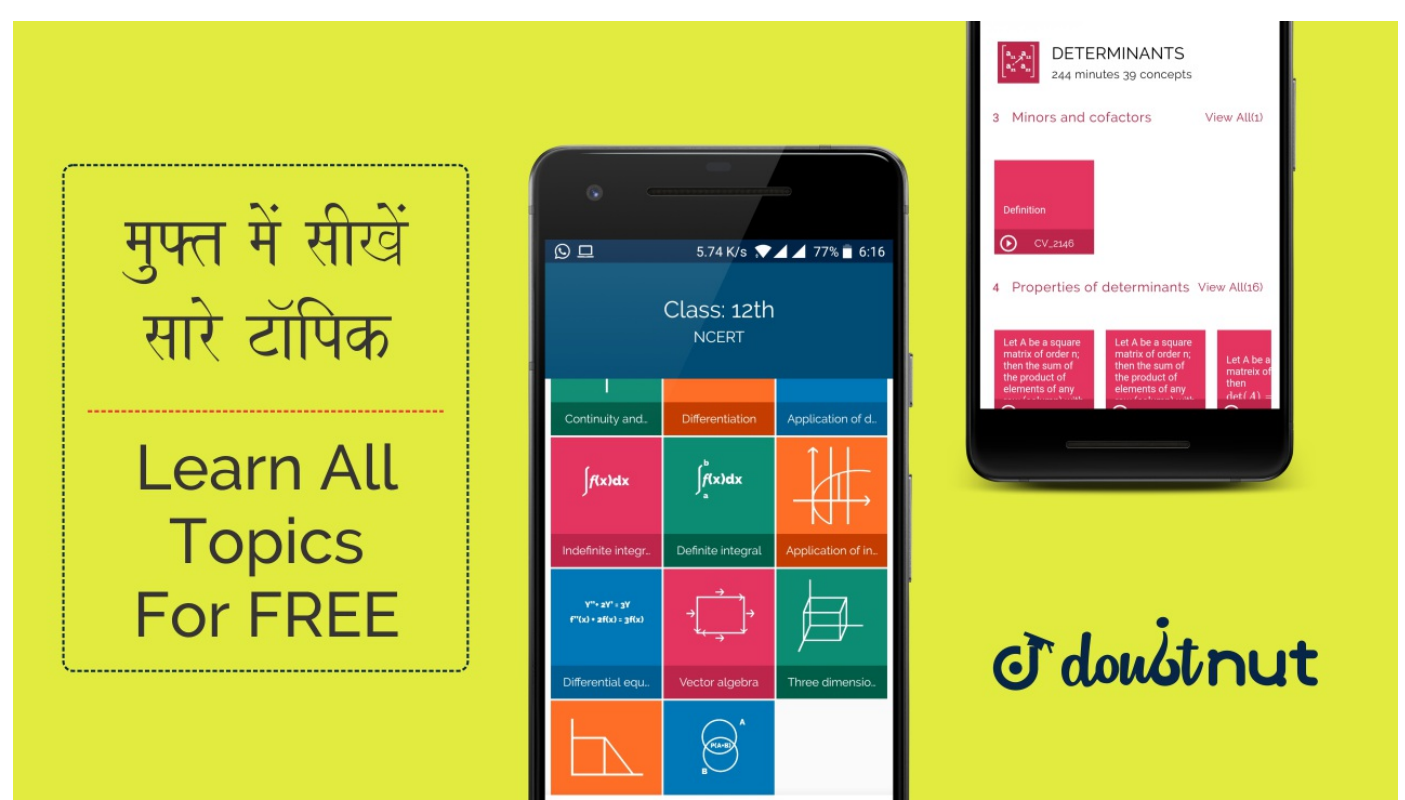| 31 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 6**<br><br>Write the component statements of the following compound statements and check whether the compound statement is true or false. (i)      A line is straight and extends indefinitely in both directions. (ii)      0 is less than every positive integer and every negative integer. (iii)      All living things have two legs and two eyes.<br><br>▶ Watch Free Video Solution on Doubtnut |
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| 32 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 7**<br><br>For each of the following statements, determine whether an inclusive "Or" or exclusive "Or" is used. Give reasons for your answer. (i)      To enter a country, you need a passport or a voter registration card. (ii)      The school is closed if it is a holiday or a Sunday. (iii)      Two lines intersect at a point or are parallel. (iv)      Students can take French or Sanskrit as their third language.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 33 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 8**<br><br>Identify the type of "Or" used in the following statements and cheek whether the statements are true or false: (i) $\sqrt{2}$ is a rational number or an irrational number. (ii) To enter into a public library children need an identity card from the school authorities. (iii) A rectangle is a quadrilateral or a 5-sided polygon.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 34 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 9**<br><br>Write the contra positive of the following statement: (i)      If a number is divisible by 9, then it is divisible by 3. (ii)      If you are born in India, then you are a citizen of India. (iii)      If a triangle is equilateral, it is isosceles.<br><br>▶ Watch Free Video Solution on Doubtnut |
| 35 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 10**<br><br>Write the converse of the following statements. (i) If a number n is even, then $n^2$ is even. (ii) If you do all the exercises in the book, you get an A grade in the class. (iii) If two integers a and b are such that $a > b$, then $a - b$ is always a positive integer.<br><br>▶ Watch Free Video Solution on Doubtnut |

**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 11**

For each of the following compound statements, first identify the corresponding component statements. Then check whether the statements are true or not. (i) If a triangle ABC is equilateral, then it is isosceles. (ii) If a and b are integers, then ab is a rational number.

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**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 12**

Given below are two pairs of statements. Combine these two statements using "if and only if". (i) p: If a rectangle is a square, then all its four sides are equal. q: If all the four sides of a rectangle are equal, then the rectangle is a square. (ii) p: If the sum of digits of a number is divisible by 3, then the number is divisible by 3. q: If a number is divisible by 3, then the sum of its digits is divisible by 3.

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**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 13**

Check whether the following statement is true or not. If x, $y \in Z$ are such that x and y are odd, then xy is odd.

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**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 14**

Check whether the following statement is true of false by proving its contra positive. If $x, \quad y \in Z$ such that xy is odd, then both x and y are odd.

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**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED**

| 40 | Verify by the method of contradiction. $p: \sqrt{7}$ is irrational.<br><br> ▶ Watch Free Video Solution on Doubtnut |
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| 41 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 16**<br><br>By giving a counter example, show that the following statement is false. If n is an odd integer, then n is prime.<br><br> ▶ Watch Free Video Solution on Doubtnut |
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| 42 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 17**<br><br>Cheek whether "Or" used in the following compound statement is exclusive or inclusive? Write the component statements of the compound statements and use them to check whether the compound statement is true or not. Justify your answer. t: you are wet when it rains or you are in a river.<br><br> ▶ Watch Free Video Solution on Doubtnut |
| 43 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 18**<br><br>Write the negation of the following statements: (i) p: For every real number $x$, $x^2 > x$ . (ii) q: There exists a rational number x such that $x^2 = 2$ . (iii) r: All birds have wings. (iv) s: All students study mathematics at the element<br><br> ▶ Watch Free Video Solution on Doubtnut |
| 44 | **NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 19**<br><br>Using the words "necessary and sufficient" rewrite the statement "The integer n is odd if and only if $n^2$ is odd". Also check whether the statement is true. |

**NCERT - CLASS 11 - CHAPTER 14 MATHEMATICAL REASONING - SOLVED EXAMPLES - Q 20**

For the given statements identify the necessary and sufficient conditions. t: If you drive over 80 km per hour, then you will get a fine