



MATHS

BOOKS - MODERN PUBLICATION

MATHEMATICAL REASONING

Example

1. Which of the following sentences are statement? Give reason for your answer.

The sum of 5 and 7 is greater than 10



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2. Whether the following sentence is statement. Give reason for your answer :

There are 35 days in a month.



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3. Which of the following sentences are statement? Give reason for your answer.

Mathematics is difficult



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4. Which of the following sentences are statement? Give reason for your answer.

Answer this question



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5. Which of the following sentences are statement? Give reason for your answer.

All real numbers are complex numbers



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6. Which of the following sentences are statement? Give reason for your answer.

The square of a number is an even number



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7. Whether the following sentence is statement. Give reason for your answer :

Mathematics is a fun.



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8. Write the negation of the following statements.

Chennai is the capital of Tamil Nadu.



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9. Write the negation of the following statements

$\sqrt{2}$ is not a complex number



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10. Write the negation of the following statements

All triangles are not equilateral triangle



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11. Write the negation of the following statements

The number 2 is greater than 7



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12. Write the negation of the following statements

Every natural number is an integer.



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13. Write the negation of the following statement :

Both the diagonals of a rectangle have the same length.



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14. Write the negation of the following statement :

$\sqrt{7}$ is rational.



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15. Write the negation of the following statements and check whether the resulting statements are true,

Australia is a continent.



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16. Write the negation of the following statements and check whether the resulting statements are true,

There does not exist a quadrilateral which has all its sides equal.



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17. Write the negation of the following statements and check whether the resulting

statements are true,

Every natural number is greater than 0.



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18. Write the negation of the following statements and check whether the resulting statements are true,

The sum of 3 and 4 is 9.



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19. Find the component statements of the following compound statements and check whether they are true or false.

Number 3 is prime or it is odd.



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20. Find the component statements of the following compound statements and check whether they are true or false :

All integers are positive or negative.





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21. Find the component statements of the following compound statements and check whether they are true or false.

100 is divisible by 3, 11 or 5.



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22. Find the component statement of the following and check whether they are true or not.

A square is a quadrilateral and its four sides are equal.



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23. Find the component statements of the following compound statements and check whether they are true or not :

All prime numbers are either even or odd.



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24. Find the component statement of the following and check whether they are true or not.

A person who has taken mathematics or computer science can go for MCA.



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25. Find the component statements of the following compound statements and check

whether they are true or not :

Chandigarh is the capital of Haryana and U.P.



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26. Write the component statements of the following compound statements and check whether the compound statement is true or false.

$\sqrt{2}$ is a rational number or an irrational number.



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27. Find the component statements of the following compound statements and check whether they are true or not :

24 is a multiple of 2, 4 and 8.



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28. Write the component statements of the following compound statement and check whether the compound statement is true or false.

A line is Straight and extends indefinitely in both directions.



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29. Write the component statements of the following compound statement and check whether the compound statement is true or false.

0 is less than every positive integer and every negative integer.



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30. Write the component statements of the following compound statement and check whether the compound statement is true or false.

All living things have two legs and two eyes.



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31. Write the component statements of the following compound statement and check whether the compound statement is true or

false.

$\sqrt{2}$ is a rational number or an irrational number.



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32. Find the component statements of the following compound statements and check whether they are true or false :

All integers are positive or negative.



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33. Write the component statements of the following compound statement and check whether the compound statement is true or false.

All primes are either even or odd.



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34. For the following compound statement first identify the connecting words and then break it into component statement :

All rational numbers are real and all real numbers are not complex.



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35. For each of the following compound statements first identify the connecting words and then break it into components statements
Square of an integer is positive or negative.



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36. For each of the following compound statements first identify the connecting words and then break it into components statements

The sand heats up quickly is the sun and does not cool down fast at night.



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37. For each of the following compound statements first identify the connecting words and then break it into components statements

$x=2$ and $x=3$ are the roots of the equation

$$3x^2 - x - 10 = 0$$



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38. State whether the OR used in the following statements is exclusive or inclusive

sun rises or moon sets



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39. State whether the OR used in the following statements is exclusive or inclusive to apply for a driving license you should have a ration card or a passport.



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40. State whether the OR used in the following statements is exclusive or inclusive All integers are positive or negative.



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41. Check whether “or” used in the following compound statement is exclusive or inclusive ?

Write the component statements of the compound statement 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.



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42. Write the negation of the following compound statement :

$3+2=5$ and $7 < 9$.



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43. Write the negation of the following compound statement :

27 is divisible by 3 or sky is blue.



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44. Write the negation of the following compound statement :

Jaipur is in India and Washington is not in India.



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45. Identify the quantifier of the following statement :

For every real number x , $x + 3 > x$.



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46. Identify the quantifier of the following statement :

There exists a real number x such that \sqrt{x} is a natural number.



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47. Identify the quantifier of the following statement :

Some real numbers are rational.



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48. Identify the quantifier of the following statement :

All birds can fly.



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49. Identify the quantifier in the following statements and write the negation of the statements

There exists a number which is equal to its square.



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50. Identify the quantifier in the following statements and write the negation of the statements

For every real number x , x is less than $x+1$



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51. Identify the quantifier in the following statements and write the negation of the

statements

There exists a capital for every state in india.



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52. Write each of the statement in the form if p and then q

p: It is necessary to have a password to log on to the server.



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53. Write each of the following statements in the form "if p then q "

q : There is traffic Jam whenever it rain.



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54. Write each of the statement in the form if p and then q

q : you can access the website only if you pay a subscription fee.



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55. Write each of the statements in the form if
then

To get an A^+ in the class it is necessary that
you do all the exercises of all the book.



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56. Which of the following statements are
true ?

If a number is divisible by 9, it must be divisible
by 3.



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57. Write the contra positive of the following statements:

If you are born in India, then you are a citizen of India.



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58. Write the contrapositive of the following statement :

If a triangle is equilateral, it is isosceles.



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59. Write the converse of the following statement :

If a number n is odd, then n^2 is odd.



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60. Write the converse of the following statement :

If two integers a and b are such that $a > b$, then $(a-b)$ is always a positive integer.



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61. state the converse and contapositive of the given following statement :

If you live in Delhi, then you have winter clothes.



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62. Given the following statement :

If you do not have winter clothes, then you do not live in Delhi. write its converse.



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63. Given the following statement :

If you have winter clothes, then you live in Delhi Identify these as contrapositive or converse of each other.



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64. Given below are two pairs of statements.

Combine these two statements using if and only if :

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.



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65. Given below are two pairs of statements. Combine these two statements using if and only if :

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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66. 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.



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67. Determine the truth value of the following :

$5+4=9$ iff $8-2=6$.



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68. Determine the truth value of the following

:

Apple is a fruit iff Delhi is in Japan.



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69. Give below are two statements

p : 25 is a multiple of 5 q : 25 is a multiple of 8.

Write the compound statement connecting these two statements with And and Or in both cases check the validity of the compound statement.



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70. 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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71. Show that the statement

IF x is a real number such that $x^3 + 4x = 0$

then $x = 0$ is true by

direct method



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72. Show that the statement

IF x is a real number such that $x^3 + 4x = 0$

then $x = 0$ is true by

method of contradiction



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73. Show that the statement

IF x is a real number such that $x^3 + 4x = 0$

then x is 0 is true by

method of contrapositive



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74. Show that the following statement is true

by the method of contrapositive

r : If x is an integer and x^2 is even, then x is

also even.





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75. By giving a counter example, show that the following statement is not true : p: If the angles of a triangle are equal, then the triangle is an obtuse angled triangle.



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76. Verify by the method of contradiction that $\sqrt{7}$ is irrational.



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77. Which of the following statements are true and which are false?

In each case give a valid reason for your answer.

p: Each radius of a circle is a chord of the circle.



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78. Whether the following statement is true or false? Give a valid reason for saying so.

q: The centre of a circle bisects each chord of the circle.



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79. Whether the following statement is true or false? Give a valid reason for saying so.

r: Circle is a particular case of an ellipse.



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80. Whether the following statement is true or false? Give a valid reason for saying so.

s: If x and y are integers such that $x > y$, then $-x < -y$.



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81. Whether the following statement is true or false? Give a valid reason for saying so.

t: $\sqrt{11}$ is a rational number.



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82. Check in validity of the following statement
: Square of an integer is positive or negative .



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83. By giving a counter example, show that the following statement is false. "If n is an odd integer, then n is prime."



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84. 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.



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85. By giving a counter example , show that the following statement is not true.

r : The equation $x^2 - 1 = 0$ does not have a root lying between 0 and 2.



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86. Check whether the following statement is true or false by proving its contrapositive : “If $x, y \in \mathbb{Z}$, such that xy is odd, then both x and y are odd.”



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87. Check whether the following statement is true or not : “If $x, y \in \mathbb{N}$ are such that x and y are even, then xy is even.”



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88. Show by contradiction $p = \sqrt{2}$ is irrational.



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89. Write the following statement in five different ways, conveying the same meaning :
 p : If a triangle is equiangular, then it is an obtuse-angled triangle.



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90. For the following compound statements, first identify the corresponding component Statements. Then check whether the statements are true or not :

If a triangle ABC is equilateral, then it is isosceles.



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91. For the following compound statements, first identify the corresponding component Statements. Then check whether the

statements are true or not :

If a, b are integers, then ab is a rational number.



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92. Check the validity of the statement given below by the method given against it.

The sum of an irrational number and a rational number is irrational.



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93. Check the validity of the statement given below by the method given against it.

q: If n is a real number when $n > 3$ then $n^2 > 9$

.



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94. By giving a counter example, show that the following statement is false. "If n is an odd integer, then n is prime."



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95. By giving a counter example, show that the following statement is not true :

The equation $x^2 - 4 = 0$ does not have a root lying between 0 and 3.



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96. Determine whether the argument used to check the validity of the following statement is correct. p: “If x^2 is irrational, then x is ration.”



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Exercise

1. Whether the following is statement or not ?

Give reason for your answer :

Rajendra Prasad was the first President of India.



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2. Whether the following is statement or not ?

Give reason for your answer :

The sun is a star.



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3. Whether the following is statement or not ?

Give reason for your answer :

The number 6 has three prime factors.



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4. Which of the following sentences are statement? Give reason for your answer.

The sum of all interior angles of a triangles is 180°



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5. Whether the following is statement or not ?

Give reason for your answer :

There is no rain without clouds.



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6. Whether the following is statement or not ?

Give reason for your answer :

8 is less than 6.



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7. Whether the following is statement or not ?

Give reason for your answer :

Who are you ?



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8. Which of the following sentences are statement? Give reason for your answer.

Today is a windy day



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9. Whether the following is statement or not ?

Give reason for your answer :

Where is your bag ?



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10. Whether the following is statement or not

? Give reason for your answer :

Who are you ?



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11. Whether the following is statement or not ?

Give reason for your answer :

His birth day is 29th February.



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12. Whether the following is statement or not

? Give reason for your answer :

Listen on me, John !



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13. Classify the following statement as 'true' or

'false' :

Congruent triangles are also similar.



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14. Classify the following statement as 'true' or 'false':

$$2+1=3.$$



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15. Classify the following statement as 'true' or 'false':

$$2+7=6.$$



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16. Classify the following statement as 'true' or 'false':

$$2+3<6.$$



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17. Classify the following statement as 'true' or 'false':

17 is a prime number.



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18. Classify the following statement as 'true' or 'false':

Number of ways of seating two persons in two chairs out of n persons is ${}^n P_2$.



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19. Classify the following statement as 'true' or 'false':

A triangle has four sides.



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20. Classify the following statement as 'true' or 'false':

$\sin (A + B) = \sin A + \sin B$ for all values of A and B.



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21. Classify the following statement as 'true' or 'false':

Moon is a heavenly body.



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22. Whether the following is statement ? Write the truth value :

There are only finite number of rational numbers.



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23. Whether the following is statement ? Write the truth value :

Similar triangles are also congruent.



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24. Which of the following sentences are statement? Give reason for your answer.

The square of a number is an even number



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25. Whether the following is statement ? Write the truth value :

Product of (-1) and 8 is 8 .



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26. Whether the following is statement ? Write the truth value :

All integers are natural numbers.



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27. Whether the following is statement ? Write the truth value :

Zero is a complex number.



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28. Whether the following is statement ? Write the truth value :

Every set is a finite set.



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29. Whether the following is statement ? Write the truth value :

Sum of an even number and odd number is always an even number.





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30. Whether the following is statement ? Write the truth value :

Sides of quadrilateral have equal length.



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31. Whether the following is statement ? Write the truth value :

He is an honest man.



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32. Whether the following is statement ? Write the truth value :

How far is Chennai from here ?



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33. Whether the following is statement ? Write the truth value :

Sky is blue.



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34. Give three examples of sentences, which are not statements. Give reasons for your answers.



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35. Write the negation of the following statement :

p : For every positive real number x , the number $x-1$ is also positive.



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36. Write the negation of the following statements

p : all cats scratch.



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37. Write the negation of the following statements

q : For every real number x . either $x > 1$ or $x < 1$



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38. Write the negation of the following statement :

s: There exists a number x such that 0



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39. Write the negation of the following statement :

p: Hyderabad is the capital of Andhra.





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40. Write the negation of the following statement :

q: The earth is round.



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41. Write the negation of the following statement :

r: The sun is cold.



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42. Write the negation of the following statement :

s : Some even integers are prime.



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43. Write the negation of the following statement :

p: Each natural number is greater than 0.



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44. Write the negation of the following statement :

q : The sum of 2 and 5 is 6.



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45. Write the negation of the following statement :

r : The whole number is an integer.



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46. Write the negation of the following statement :

s: A rectangle is a pentagon or a quadrilateral.



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47. Write the negation of the following statement :

t : Asia is a continent.



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48. Write the negation of the following statement : Both the diagonals of a Rhombus have the same length .



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49. Write the negation of the following statement :

q: $\sqrt{5}$ is rational.



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50. Write the negation of the following statement :

r: -5 is greater than - 3.



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51. Write the negation of the following statement :

s: $5+3=7$.



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52. Write the negation of the following statement :

p: For every real number x , $x^2 > x$.



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53. Write the negation of the following statement :

q : There exists a rational number x such that $x^2 = 2$.



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54. Write the negation of the following statement :

r: All birds have wings.



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55. Write the negation of the following statement :

s : All students study Mathematics at the elementary level.



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56. Are the following pairs of the statement negation of each other

The number x is not a rational number

The number x is not an irrational number



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57. Are the following pairs of the statement negation of each other

The number x is not a rational number

The number is x is not an irrational number



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58. Find the component statements of the following compound statements :

0 is a positive number or a negative number.



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59. Find the component statements of the following compound statements :

25 is a multiple of 5 and 8.



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60. Find the component statements of the following compound statements :

All rational numbers are real and all real numbers are complex.



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61. Find the component statements of the following compound statements :

The sun shines or it rains.



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62. Find the component statements of the following compound statements :

The sky is blue and the grass is green.



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63. Find the component statements of the following compound statements :

The earth is round or the sun is cold.



Watch Video Solution

64. Find the component statements of the following compound statements :

Roses are red and lilies are white.



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65. Find the component statements of the following compound statements :

It is raining and it is cold.



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66. Find the component statements of the following compound statements :

There is something wrong with the bulb or with wiring.



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67. Find the component statement of the following and check whether they are true or not.

All prime numbers are either even or odd.



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68. Find the component statement of the following and check whether they are true or not.

24 is a multiple of 2,4 and 8.





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69. Find the component Statements of the following and check whether they are true or not :

45 is a multiple of 3, 5 and 9.



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70. Find the component Statements of the following and check whether they are true or

not :

$x=1$ and $x=-1$ are roots of $x^2 - 1 = 0$.



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71. Find the component Statements of the following and check whether they are true or

not :

A rhombus is a quadrilateral and a pentagon.



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72. Find the component Statements of the following and check whether they are true or not :

India is a democracy and a monarchy.



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73. Find the component Statements of the following and check whether they are true or not :

The earth revolves around the sun or the moon.



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74. Find the component Statements of the following and check whether they are true or not :

Milk is solid or water is a liquid.



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75. For each of the following compound statements first identify the connecting words and then break it into components statements
 $x=2$ and $x=3$ are the roots of the equation

$$3x^2 - x - 10 = 0$$



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76. For the following compound statements, identify the connecting words and then write the component statement :

13 is not a prime number or 15 is not a composite number.



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77. For the following compound statements, identify the connecting words and then write the component statement :

$2 + 3i$ is a real number or $2 + 3i$ is a complex number.



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78. For the following compound statements, identify the connecting words and then write the component statement :

Anush is rich or happy.



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79. For the following compound statements, identify the connecting words and then write the component statement :

The sun is cold and the moon revolves around the sun.



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80. For the following compound statements, identify the connecting words and then write the component statement :

The school works or a holiday is declared.



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81. Write the truth value of the following compound statement :

$5+5=10$ and $4+8=12$.



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82. Write the truth value of the following compound statement :

$5+5=10$ or $4+8=12$.



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83. Write the truth value of the following compound statement :

$5+5=10$ and $4+8=13$.



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84. Write the truth value of the following compound statement :

$5+5=10$ or $4+8=13$.



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85. Write the truth value of the following compound statement :

$5+5=11$ and $4+8=12$.



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86. Write the truth value of the following compound statement :

$5+5=11$ or $4+8=12$.



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87. Write the truth value of the following compound statement :

$5+5=11$ and $4+8 = 13$.



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88. Write the truth value of the following compound statement :

$5+5=11$ or $4+8 = 13$.



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89. Write the truth value of the following compound statement :

Blue whale is a mammal or a raptile.



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90. Write the truth value of the following compound statement :

Sri Lanka is an island country and Yamuna is a river.



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91. Write the component statements of the following compound statements and check whether the compound statement is true or false.

All rational numbers are real and all real numbers are not complex.



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92. Write the component statements of the following compound statements and check

whether the compound statement is true or false.

$x = 2$ and $x = 3$ are the roots of $3x^2 - x - 10 = 0$.



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93. Write the component statements of the following compound statements and check whether the compound statement is true or false.

The sand heats up quickly in the sun and does not cool down fast at night.



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94. Write the component statements of the following compound statements and check whether the compound statement is true or false.

Bangalore is the capital of Andhra and Karnataka.



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95. Write the component statements of the following compound statements and check whether the compound statement is true or false.

125 is a multiple of 7 or 8.



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96. Write the component statements of the following compound statements and check whether the compound statement is true or

false.

Mumbai is the capital of Gujarat or Maharashtra.



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97. Write the component statements of the following compound statement and check whether the compound statement is true or false.

$\sqrt{2}$ is a rational number or an irrational number.



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98. Write the component statements of the following compound statements and check whether the compound statement is true or false.

A square is a polygon or a parallelogram.



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99. Write the component statements of the following compound statements and check

whether the compound statement is true or false.

A rectangle is a quadrilateral and hexagon.



[Watch Video Solution](#)

100. Identify the type of 'Or' used in the following statement and check whether the statement is true or false.

$\sqrt{2}$ is a rational number or an irrational number.



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101. Identify the type of 'Or' used in the following statement and check whether the statement is true or false.

To enter into public library children need an identity card from the school or a letter from the school authorities.



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102. Identify the type of 'Or' used in the following statement and check whether the

statement is true or false.

A rectangle is a quadrilateral or a 5-sided polygon.



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103. For the following Statement, determine whether an inclusive 'Or' or exclusive 'Or' is used. Give reasons for your answer.

To enter a country, you need a passport or a voter registration card.



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104. For the following Statement, determine whether an inclusive 'Or' or exclusive 'Or' is used. Give reasons for your answer.

The school is closed if it is a holiday or a Sunday.



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105. For the following Statement, determine whether an inclusive 'Or' or exclusive 'Or' is

used. Give reasons for your answer.

Two lines intersect at a point or are parallel.



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106. For the following Statement, determine whether an inclusive 'Or' or exclusive 'Or' is used. Give reasons for your answer.

Students can take French or Sanskrit as their third language.



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107. Write the negation of the following :

$x > 3$ or $x < 3$.



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108. Write the negation of the following :

Sky is blue and $7 < 9$.



Watch Video Solution

109. Write the negation of the following :

Anil is cruel or he is strict.



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110. For each of the following compound statements first identify the connecting words and then break it into components statements

The sand heats up quickly is the sun and does not cool down fast at night.



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111. Check whether the following pairs of statements are negation of each other. Give reasons for your answer.

$x + y = y + x$ is true for every real number x and y .

There exists real number x and y for which $x + y = y + x$



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112. Let p : It is raining to-day and q : There is no light in this room. Give a single verbal sentence, which describes the following :

$\sim q$.



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113. Let p : It is raining to-day and q : There is no light in this room. Give a single verbal sentence, which describes the following :

$\sim q$.





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114. Let p : It is raining to-day and q : There is no light in this room. Give a single verbal sentence, which describes the following :

$\sim q$.



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115. Let p : It is raining to-day and q : There is no light in this room. Give a single verbal

sentence, which describes the following :

$\sim q$.



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116. Let p : It is raining to-day and q : There is no light in this room. Give a single verbal sentence, which describes the following :

$\sim p$ or $\sim q$.



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117. Identify the quantifier in the following statement and state its type :

For every $x \in N$, $x + 3$ is greater than x .



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118. Identify the quantifier in the following statement and state its type :

There exists $x \in N$, $x + 3 = 9$.



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119. Identify the quantifier in the following statement and state its type :

Some real numbers are rational .



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120. Identify the quantifier in the following statement and state its type :

Any integer is either positive or negative.



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121. Identify the quantifier in the following statement and state its type :

Every city in U.S.A. is clean.



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122. Identify the quantifier in the following statement and state its type :

There exists a living person who is 175 years old.



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123. Write the negation of the following :

For every real number x , $x + 0 = x = 0 + x$.



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124. Write the negation of the following :

For every real number x , x is less than $x + 1$.



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125. Write the negation of the following :

There exists a real number which is equal to its square.



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126. Write the negation of the following :

All the students have completed their home work.



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127. Write the negation of the following statement.

Every child is naughty or intelligent.



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128. Write the negation of the following statement.

Some diseases are curable and not infectious.



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129. Identify the quantifier in the following statements and write the negation of the statements

There exists a capital for every state in india.



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130. Write the negation of the following statement.

All forms of carbon are not hard.



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131. Write the negation of the following statement.

All cars are not fast and safe.



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132. Rewrite the following statement if then in five different ways conveying the same meaning

If a natural number is odd, then its square is also odd.



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133. Write the following statement in the form

'if p , then q ' :

You get a job implies that your credentials are good.



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134. Write the following statement in the form

'if p , then q ' :

The Bannana tree will bloom if it stays warm for a month.



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135. Write the following statement in the form 'if p , then q ' :

A number is even if it is a multiple of 2.



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136. Write each of the statements in the form
if then

A quadrilateral is a parallelogram if its
diagonals bisect each other.



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137. Write the following statement in the form
'if p, then q':

To pass in examination it is necessary that you
work hard.





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138. Write the following statement in the form

'if p , then q ' :

It is necessary to be rich in order to be happy.



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139. Write the following statement in the form

'if p , then q ' :

Whenever it rains it is cold.



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140. Write the following statement in the form

'if p , then q ' :

You earn a living implies you work.



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141. Write the following statement in the form

'if p , then q ' :

The crops will be destroyed if there is a flood.



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142. For the following compound statements, first identify the corresponding component statements. Then check whether the statements are true or not.

If Kota is in India, then $7 + 7 = 14$.



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143. For the following compound statements, first identify the corresponding component statements. Then check whether the

statements are true or not.

If Kota is in England, then $7 + 7 = 14$.



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144. For the following compound statements, first identify the corresponding component statements. Then check whether the statements are true or not.

If Kota is in India, then $7 + 7 = 15$.



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145. For the following compound statements, first identify the corresponding component statements. Then check whether the statements are true or not.

If Kota is in India, then $7 + 7 = 14$.



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146. Let p : 'He is rich' and q : 'He is happy' be the given statements. Write the following statement in the symbolic form, using p and q .
If he is rich, then he is unhappy.



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147. Let p : 'He is rich' and q : 'He is happy' be the given statements. Write the following statement in the symbolic form, using p and q .
It is necessary to be happy in order to be poor.



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148. Let p : 'He is rich' and q : 'He is happy' be the given statements. Write the following

statement in the symbolic form, using p and q .

To be poor is to be unhappy.



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149. Write the contrapositive and converse of the following :

IF x is a prime number, then x is odd.



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150. Write the contrapositive and converse of the following statements

If the two lines are parallel, then they do not intersect in the same plane.



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151. Write the contrapositive and converse of the following statements

Something is cold implies that it has low temperature.





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152. Write the contrapositive and converse of the following statement :

You cannot comprehend geometry if you do not know how to reason deductively.



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153. Write the contrapositive and converse of the following statements

x is an even number implies that x is divisible by 4



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154. State the converse and contrapositive of the following statements

p : A positive integer is prime only if it has no divisors other than 1 and itself.



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155. State the converse and contrapositive of the following statements

q: if it is hot outside then you feel thirsty.



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156. Given the following statement :

If a quadrilateral is a parallelogram, then its diagonals bisect each other.

Identify these as contrapositive or converse of each other.





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157. Given the following statement :

If the diagonals of a quadrilateral do not bisect each other, then the quadrilateral is not a parallelogram. Identify these as contrapositive or converse of each other.



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158. Given the following statement :

If the diagonals of a quadrilateral bisect each

other, then it is a parallelogram. Identify these as contrapositive or converse of each other.



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159. Rewrite each of the following statements in the form p if and only if q

p : if you watch television then your mind is free and if your mind is free then you watch television.



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160. Rewrite each of the following statements in the form p if and only if q

q : for you to get an A grade is necessary and sufficient that you do all the homework regularly.



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161. Rewrite the following statement in the form ' p if and only if q '.

r : If a quadrilateral is equiangular, then it is a

rectangle and if a quadrilateral is a rectangle, then it is equiangular.



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162. p : If a tumbler is half empty then it is half full
 q : if a tumbler is half full then it is half empty

Combination of these two statements is



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163. Given below are pairs of statements.

Combine them using 'if and only if' :

p: if Anil is intelligent, then he scores 92%. q :

If Anil scores 92%. then he is intelligent.



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164. Given below are pairs of statements.

Combine them using 'if and only if' :

p: If two lines are parallel, then their slopes

are equal. q: If the slopes of two lines are equal, then they are parallel.



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165. Determine the truth value of the following statement :

$3+3 =6$ iff $2+2 =4$.



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166. Determine the truth value of the following statement :

$$3+3 =6 \text{ iff } 4+3 =8.$$



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167. Determine the truth value of the following statement :

$$3+3 =7 \text{ iff } 3+4 =7.$$



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168. Determine the truth value of the following statement :

$$3+3 =7 \text{ iff } 5+2 =6.$$



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169. Using the words necessary and sufficient rewrite the statement. The integer n is odd if and only if n^2 is odd Also choice whether the statement is true.



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