

1. The converse of a conditional statement is found by switching the hypothesis and the conclusion.

Rewrite the conditional statement in if-then form

2. When  $x = 6$ ,  $x^2 = 36$

If  $x = 6$ , then  $x^2 = 36$

3. The measure of a straight angle is  $180^\circ$

If an angle is straight, then its measure is  $180^\circ$

4. Only people who are registered are allowed to vote.

If a person is registered, then they are allowed to vote.

For the given statement, write the hypothesis, conclusion, converse, inverse and contrapositive. If possible, write a biconditional statement.

5. *If two angles are complementary, then the two angles add up to  $90^\circ$*

What is the hypothesis? two angles are complementary

What is the conclusion? the two angles add up to  $90^\circ$

Write the converse: If two angles add up to  $90^\circ$ , then the two angles are complementary.

Write the inverse: If two angles are NOT complementary, then the two angles do NOT add up to  $90^\circ$ .

Write the contrapositive: If two angles do NOT add up to  $90^\circ$ , then the two angles are NOT complementary.

If you can, write as a biconditional statement: Two angles are complementary iff the two angles add up to  $90^\circ$ .

6. *If an animal is an ant, then it is an insect.*

What is the hypothesis? an animal is an ant

What is the conclusion? it is an insect

Write the converse: If it is an insect, then the animal is an ant.

Write the inverse: If an animal is NOT an ant, then it is NOT an insect.

Write the contrapositive: If it is NOT an insect, then the animal is NOT an ant.

If you can, write as a biconditional statement: Not possible, converse is not always true.

7. Describe and correct the error in writing the if-then.

Given statement: All high school students take four English courses.

If-then statement: If a high school student takes four courses, then all four are English courses.

Ex. If a student is in high school, then they take four English courses.

they are able to take diff courses.

Decide whether the statement is true or false. If false, provide a counterexample.


8. If a polygon has five sides, then it is a regular pentagon.

False; 

9. If  $m\angle A$  is  $85^\circ$ , then the measure of the complement of  $\angle A$  is  $5^\circ$ .

True

10. Supplementary angles are always linear pairs.

False;   $m\angle 1 + m\angle 2 = 180^\circ$   
 $\angle 1$  and  $\angle 2$  is not a linear pair.

11. If a number is an integer, then it is rational.

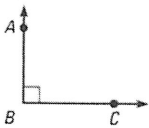
True;

12. If a number is a real number, then it is irrational.

False; A real # could be rational. Ex. 10

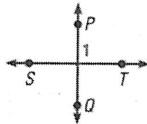
Decide whether each statement about the diagram is true. Explain your answer using the definitions you have learned.

13.  $m\angle ABC = 90^\circ$



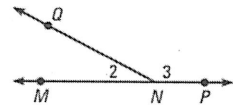
True

14.  $\overrightarrow{PQ} \perp \overrightarrow{ST}$



False; not enough information

15.  $m\angle 2 + m\angle 3 = 180^\circ$



True

Rewrite the definition as a biconditional statement.

16. An angle with a measure between  $90^\circ$  and  $180^\circ$  is called obtuse.

An angle is obtuse iff its measure is between  $90^\circ$  and  $180^\circ$

17. Two angles are a linear pair if they are adjacent angles whose noncommon sides are opposite rays.

Two angles are a linear pair iff they are adjacent angles whose noncommon sides are opposite rays.

Determine whether the statement is a valid definition.

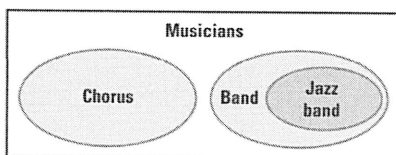
18. If two rays are opposite rays, then they have a common endpoint.

Invalid; the converse is not always true.

19. If the sides of a triangle are all the same length, then the triangle is equilateral.

Valid; both the conditional + converse are always true.

20. The Venn diagram represents all of the musicians at a high school. Write an if-then statement that describes a relationship between the various groups of musicians.



Ex. If a student is in jazz band, then they are in band and not in choir.