

Worksheet 13.1: Statements and Logical Connectives

1. What is a simple statement?
2. List the words identified as quantifiers.
3. Write the general form of the negation for the following statements.
 - (a) none are.
 - (b) some are not.
 - (c) all are.
 - (d) some are.
4. What are compound statements?
5. Draw the symbol used to represent
 - (a) conditional.
 - (b) disjunction.
 - (c) conjunction.
 - (d) negation.
 - (e) biconditional.
6. Explain how a comma is used to indicate the grouping of simple statements.
7. List the dominance of connectives from the most dominant to the least dominant.

Indicate whether the statement is a simple or compound statement. If it is a compound statement, indicate whether it is a negation, conjunction, disjunction, conditional, or biconditional by using the word and its appropriate symbol.

8. Coach Zab is in the room and Mr. Harris is in the office.

9. The copier is not out of paper.

10. If the bell rings, then we will leave class.

11. The sweater is neither blue nor red.

12. It is false that Mr. Zab is bald and short.

13. Mr. Zab is a good teacher if and only if every student passes Geometry.

Write the negation of each statement below.

14. Some books are short.

15. No fish swim.

16. All doctors make house calls.

17. All boys are smart.

18. Some students maintain an A average.

19. All people who earn money pay taxes.

Write the statement in symbolic form. Let

p: Geometry is fun.

q: Mr. Zab is smart.

20. Geometry is fun and Mr. Zab is not smart.

21. Geometry is not fun.

22. Mr. Zab is not smart if and only if Geometry is not fun.

23. If Geometry is fun, then Mr. Zab is smart.

Write the compound statement in words. Let

p: FRA is cool.

q: Mr. Zab is tall.

24. $\sim q$

25. $p \vee q$

26. $\sim p \wedge \sim q$

27. $\sim q \longrightarrow p$

28. $\sim p \longleftrightarrow \sim q$

29. $\sim(p \wedge q)$

30. $\sim(p \leftrightarrow \sim q)$

Write letters to represent the simple statements and write each statement symbolically by using parentheses and indicate whether the statement is a negation, conjunction, disjunction, conditional, or biconditional.

31. If the moon is out then it is evening or the sun is not shining.

32. It is false that if you do your homework then you will not pass Geometry.

33. FRA is not open if and only if it is not Sunday or it is before 7 A.M.