

For each statement in Exercises 5–10 copy and complete a table like the one shown below.

If  $\underline{\quad ? \quad}$ , then  $\underline{\quad ? \quad}$ . True/False

Statement	?	?
Contrapositive	?	?
Converse	?	?
Inverse	?	?

5. If I live in Los Angeles, then I live in California. True; true; false; false
6. If  $\angle 1$  and  $\angle 2$  are vertical angles, then  $m\angle 1 = m\angle 2$ . True; true; false; false
7. If  $AM = MB$ , then  $M$  is the midpoint of  $AB$ . False; false; true; true
8. If a triangle is scalene, then it has no congruent sides. True; true; true; true
9. If  $-2n < 6$ , then  $n > -3$ . True; true; true; true
10. If  $x^2 > 1$ , then  $x > 1$ . False; false; true; true

Reword the given statement in if-then form and illustrate it with a Venn diagram. What can you conclude by using the given statement together with each additional statement? If no conclusion is possible, say so.

11. Given: All senators are at least 30 years old.  
 a. Jose Avila is 48 years old. **No conclusion**  
 b. Rebecca Castelleo is a senator. **She is at least 30 years old.**  
 c. Constance Brown is not a senator. **No conclusion**  
 d. Ling Chen is 29 years old. **He is not a senator.**  
 If you are a math teacher, then you assign hours of homework.  
 a. Bridget Sullivan is a math teacher. **She assigns hours of homework.**  
 b. August Campos assigns hours of homework. **No conclusion**  
 c. Andrew Byrnes assigns no homework at all. **He is not a math teacher.**  
 d. Jason Babler is not a math teacher. **No conclusion**

What can you conclude by using the given statement together with each additional statement? If no conclusion is possible, say so.

13. Given: If it is not raining, then I am happy.  
 a. I am not happy. **It is raining. No conclusion**  
 b. It is not raining. **I am happy. No conclusion**  
 c. I am overjoyed. **No conclusion**  
 d. It is raining. **No conclusion**
14. Given: All my students love geometry.  
 a. Stu loves geometry. **Stu loves geometry.**  
 b. Luis loves geometry. **No conclusion**  
 c. Stella is not my student. **No concl.**  
 d. George does not love geometry. **He is not my student.**
15. Given: If two angles are vertical angles, then they are congruent.  
 a.  $\angle 1 \cong \angle 2$  **No conclusion**  
 b.  $m\angle ABC \neq m\angle DBF$   **$\angle ABC$  and  $\angle DBF$  are not vert.  $\Delta$ .**  
 c.  $\angle 3$  and  $\angle 4$  are adjacent angles. **No conclusion**  
 d.  $\overline{RS}$  and  $\overline{TU}$  intersect at  $V$ .  **$\angle RVU \cong \angle SVT$ ,  $\angle RVT \cong \angle SVU$**