

Example 3 Assume the given conditional is true. What can you conclude by using the given statement together with each additional statement? If no conclusion is possible, say so.

Given: If $ABCD$ is a square, then its diagonals are congruent.

- a. $AC > BD$ b. $AB = BC = CD = AD$
c. $ABCD$ is a square. d. $AC = BD$

Solution

- a. $ABCD$ is not a square. b. no conclusion
c. $AC = BD$ d. no conclusion

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

If $WXYZ$ is a rhombus, then its diagonals are perpendicular.

- a. $\overline{WY} \perp \overline{XZ}$ b. $WXYZ$ is a square.
c. $m\angle XWY + m\angle WXZ = 100$ d. $WXYZ$ is not a rhombus.

All poets are philosophers.

- a. Jose is a poet. b. Jane is a philosopher.
c. Jung is not a poet. d. Jean is not a philosopher.

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

Given: If the sun shines, then we go on a picnic.

- a. We go on a picnic. _____
b. The sun shines. _____
c. It is raining. _____
d. We do not go on a picnic. _____

What can you conclude by using the statement "If a quadrilateral is a square, then it is a rectangle" together with each additional statement? If no conclusion is possible, say so.

- a. $ABCD$ is a square. _____
b. $EFGH$ is a rectangle. _____
c. $JKLM$ is not a rectangle. _____
d. $PQRS$ is not a square. _____