

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. $AC = BD$

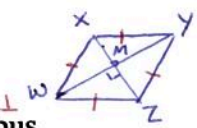
Solution

- 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. $\overline{WY} \perp \overline{XZ}$ *no conclusion*
- b. $WXYZ$ is a square. *its diag. are \perp*
- * c. $m\angle XWY + m\angle WXZ = 100$ *$WXYZ$ is not a rhombus*
- d. $WXYZ$ is not a rhombus. *no conclusion*



All poets are philosophers.

- a. Jose is a poet. *He is a philosopher*
- b. Jane is a philosopher. *no conclusion*
- c. Jung is not a poet. *no conclusion*
- d. Jean is not a philosopher. *Jean is not a poet*

* If $m\angle XWY + m\angle WXZ = 100$, then $m\angle XWY = 80^\circ$. If $m\angle XWY = 80^\circ$, then $\overline{XZ} \not\perp \overline{WY}$, so $WXYZ$ cannot be a rhombus, b/c a rhombus must have \perp diagonals

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. no conclusion
- b. The sun shines. we go on a picnic
- c. It is raining. no conclusion
- d. We do not go on a picnic. the sun is not shining

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. $ABCD$ is a rectangle
- b. $EFGH$ is a rectangle. no conclusion
- c. $JKLM$ is not a rectangle. $JKLM$ is not a square
- d. $PQRS$ is not a square. no conclusion