

Self-Test 1

Classify each conditional as true or false.

1. If $j > k$, then $k < j$.
2. If $a > b$ and $b = c$, then $a > c$.
3. If $r > t$ and $s > t$, then $r > s$.
4. If $\angle BCD$ is an exterior angle of $\triangle ABC$, then $m\angle BCD > m\angle A + m\angle B$.

Use the conditional: If $\triangle ABC$ is acute, then $m\angle C \neq 90$.

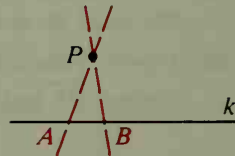
5. Write the inverse of the statement. Is it true or false?
6. Write the contrapositive of the statement. Is it true or false?
7. Write the letter paired with the statement that is logically equivalent to "If Dan can't go, then Valerie can go."

A. If Valerie can go, then Dan can't go.	B. If Dan can go, then Valerie can't go.
C. If Valerie can't go, then Dan can go.	D. If Dan can go, then Valerie can go.
8. Given: All rhombuses are parallelograms.
What can you conclude from each additional statement? If no conclusion is possible, write *no conclusion*.

a. $ABCD$ is not a parallelogram.	b. $QRST$ is not a rhombus.
c. $MNOP$ is a parallelogram.	d. $GHIJ$ is a rhombus.
9. Suppose you plan to write an indirect proof of the statement: If $AB = 7$, then $AC = 14$. Write a correct first sentence of the indirect proof.
10. Write the letters (a)–(d) in an order that completes an indirect proof of the statement: Through a point outside a line, there is at most one line perpendicular to the given line.

Given: Point P not on line k

Prove: There is at most one line through P perpendicular to k .



- (a) But this contradicts Corollary 3 of Theorem 3-11: In a triangle, there can be at most one right angle or obtuse angle.
- (b) Then $\angle PAB$ and $\angle PBA$ are right angles, and $\triangle PAB$ has two right angles.
- (c) Thus our temporary assumption is false, and there is at most one line through P perpendicular to k .
- (d) Assume temporarily that there are two lines through P perpendicular to k at A and B .