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.