Name ______________________ Date ______________

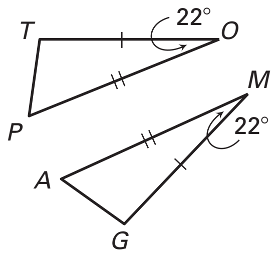
LESSON 5.6

Practice C

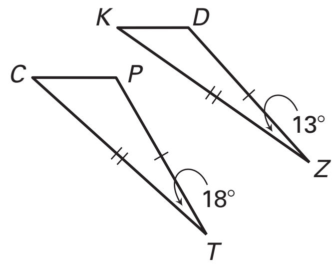
For use with the lesson "Inequalities in Two Triangles and Indirect Proof"

Complete with <, >, or = . *Explain*.

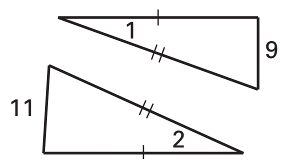
1. TP __?__ AG



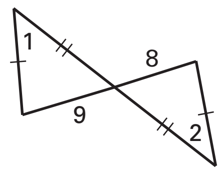
2. KD __?__ CP



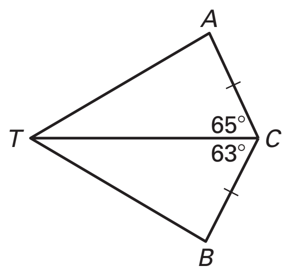
3. $m\angle 1$ __?__ $m\angle 2$



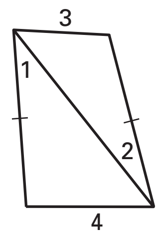
4. $m\angle 1$ __?__ $m\angle 2$



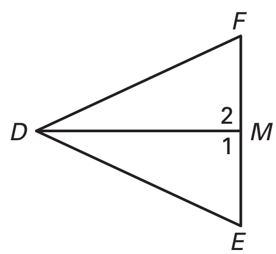
5. AT __?__ BT



6. $m\angle 1$ __?__ $m\angle 2$



In $\triangle DEF$, DM is a median. Determine if each statement is *always*, *sometimes*, or *never* true.



7. If $m\angle 2 > m\angle 1$, then $ED > FD$.

8. If $m\angle E > m\angle F$, then $\angle 1$ is obtuse.

9. If $\angle 2$ is acute, then $m\angle F > m\angle E$.

10. If $m\angle E < m\angle F$, then $m\angle 1 < m\angle 2$.

11. If $m\angle 2 = 90°$, then $ED > FD$.

12. If $m\angle D = 90°$, then $FD > ED$.

LESSON 5.6

Name ______________________________ Date ______________

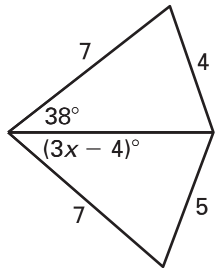
LESSON 5.6

Practice C *continued*

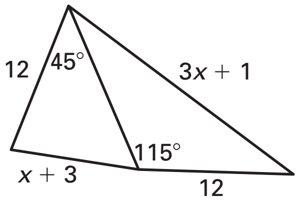
For use with the lesson "Inequalities in Two Triangles and Indirect Proof"

Use the Hinge Theorem or its converse and properties of triangles to write and solve an inequality to describe a restriction on the value of *x*.

13.



14.



15. Sailing Two families are going sailing. Family A leaves the marina and sails 2.3 miles due north, then sails 3 miles due west. Family B leaves the marina and sails 2.3 miles due south, then sails 3 miles in a direction 1° north of due east. Which family is farther from the marina? *Explain* your reasoning.

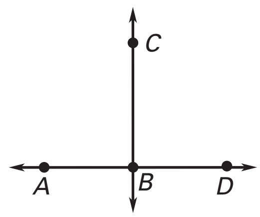
In Exercises 16–18, write an indirect proof.

16. GIVEN: $\triangle JKL$ is a scalene triangle.

PROVE: No two angles of $\triangle JKL$ are congruent.

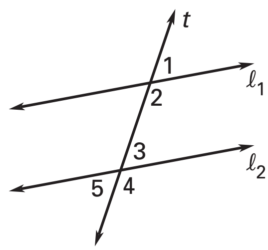
17. GIVEN: $\angle ABC \not\cong \angle DBC$

PROVE: $\overline{BC} \not\perp \overline{AD}$



18. GIVEN: $\angle 1 \not\cong \angle 5$

PROVE: $\angle 2$ and $\angle 3$ are not supplementary.



ANSWERS

Lesson 5.6 Inequalities in Two Triangles and Indirect Proof

Practice Level C

1. = **2.** < **3.** < **4.** > **5.** > **6.** > **7.** never **8.** never **9.** always **10.** never **11.** never **12.** sometimes **13.** $x > 14$ **14.** $x > 1$

Lesson 5.6 Inequalities in Two Triangles and Indirect Proof, continued

15. Family A; The included angle for Family A is 90° and for Family B is 89°.

16. *Sample answer:* Suppose two angles of $\triangle JKL$ are congruent. Then, by the Converse of the Base Angles Theorem, the two sides opposite these angles are congruent. But this contradicts the given information that $\triangle JKL$ is a scalene triangle. So, if $\triangle JKL$ is a scalene triangle, then no two angles of $\triangle JKL$ are congruent. **17.** Assume that $\overline{BC} \perp \overline{AD}$. Then, because $\overline{BC}$ and $\overline{AD}$ are $\perp$, they intersect to form 4 right angles. And since all right angles are congruent, $\angle ABC \cong \angle DBC$. But this contradicts the given information that $\angle ABC \not\cong \angle DBC$. The assumption that $\overline{BC} \perp \overline{AD}$ is false. Therefore, $\overline{BC} \not\perp \overline{AD}$. **18.** Assume that $\angle 2$ and $\angle 3$ are supplements. Then, by the Consecutive Interior Angles Converse, $\ell_1 \parallel \ell_2$. So, if $\ell_1 \parallel \ell_2$ then $\angle 1 \cong \angle 3$ by the Corresponding Angles Postulate. We know that $\angle 3 \cong \angle 5$ because they are vertical angles. Then by the Transitive Property of Congruence, $\angle 1 \cong \angle 5$. But this contradicts the fact that $\angle 1 \not\cong \angle 5$. The assumption that $\angle 2$ and $\angle 3$ are supplements is false. Therefore, $\angle 2$ and $\angle 3$ are not supplementary.