Name ______________________________________ Date __________________ Class__________________

3.4 Practice

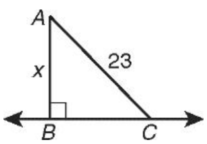
Perpendicular Lines

1. The perpendicular bisector of a segment is a line ______________________

   to a segment at the segment's ______________________. .

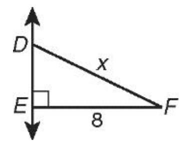
2. The shortest segment from a point to a line is ______________________ to the line.

For Exercises 3 and 4, name the shortest segment from the point to the line and write an inequality for *x*.

3. 

Shortest Segment _____

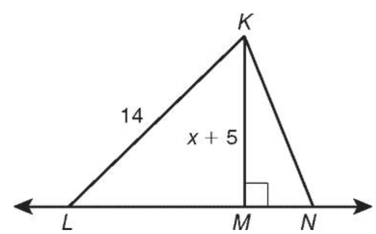
____

4. 

Shortest Segment _______

____

Use the figure for Exercises 5 and 6.



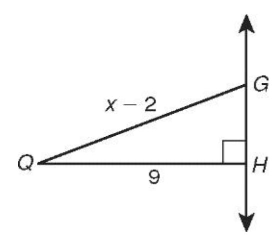
5. Name the shortest segment from point *K* to $\overleftrightarrow{LN}$.

   ____

6. Write and solve an inequality for *x*.

   ____

Use the figure for Exercises 7 and 8.



7. Name the shortest segment from point *Q* to $\overleftrightarrow{GH}$.

   ____

8. Write and solve an inequality for *x*.

   ____

Fill in the blanks to complete these theorems about parallel and perpendicular lines.

9. If two coplanar lines are perpendicular to the same line, then the two lines are

   ______________________ to each other.

10. If two intersecting lines form a linear pair of ______________________ angles,

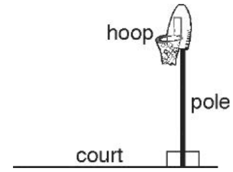
    then the lines are perpendicular.

11. In a plane, if a transversal is perpendicular to one of two parallel lines, then it is

    ______________________ to the other line.

Name ____ Date __________________ Class__________________

Use the drawing of a basketball goal for Exercises 12–14. In each exercise, justify the conclusion with one of the completed theorems from Exercises 9–11. Write the number 9, 10, or 11 in each blank to tell which theorem you used.



12. The basketball pole intersects the court to form a linear pair of angles that are congruent.

    So the pole and the court must also be perpendicular. ________________________

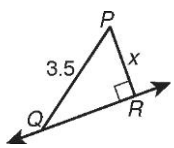
13. The hoop and the court are both perpendicular to the pole.

    So the hoop and the court must be parallel to each other. ________________________

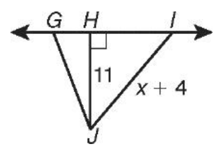
14. The hoop and the court are parallel to each other. The hoop is also perpendicular to the pole.

    Therefore the pole and the court must also be perpendicular. ________________________

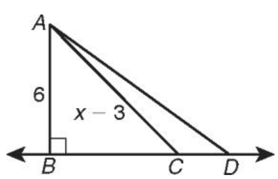
For Exercises 1–4, name the shortest segment from the point to the line and write an inequality for *x*.

15. 

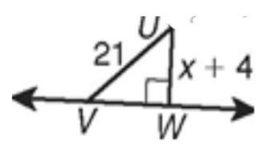
____

16. 

____

17. 

____

18. 

____

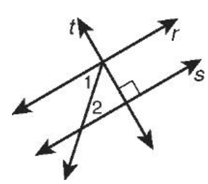
Complete the two-column proof.

19. Complete the two-column proof with the correct theorem.

Given: $\angle 1 \cong \angle 2$, $s \perp t$

Prove: $r \perp t$

Proof:



Statements	Reasons
1. $\angle 1 \cong \angle 2$	1. Given
2. $r \parallel s$	2. If alt. int. angles are congruent then the lines are parallel.
3. $s \perp t$	3. Given
4. $r \perp t$	4. ________________________________