

1. "If-Then" statements are called \_\_\_\_\_.  
the portion following the "if" is called the \_\_\_\_\_.  
the portion following the "then" is called the \_\_\_\_\_.
  2. By switching the above , the \_\_\_\_\_ statement is formed.  
Statements that prove claims to be false are called \_\_\_\_\_.
  3. If all of the statements are true, a \_\_\_\_\_ or definition can be formed.  
Instead of "if-then" statements, these have the form \_\_\_\_\_.
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Use the following statement for questions #4 - #8.

*Hypothesis: It is a salmon*

*Conclusion: It is a fish*

4. Write a conditional based on the above:  
\_\_\_\_\_
5. Write the converse of the above conditional:  
\_\_\_\_\_
6. Is the converse true? Yes or No: \_\_\_\_\_
7. If it is true, write the biconditional. If it is false, give a counter example.  
\_\_\_\_\_
8. Create a Euler Diagram for the conditional:

Use the following statement for questions #9 - #12.

*A no parking sign is a street sign with a "p" crossed out.*

9. Write a conditional based on the above:

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10. Write the converse of the above conditional:

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11. Is the converse true? Yes or No: \_\_\_\_\_

12. If it is true, write the biconditional. If it is false, give a counter example.

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13. List the following conditionals in order so they make a logical chain.

\_\_\_\_\_ If I am able to ask questions, I will understand more.

\_\_\_\_\_ If I complete the homework, then I will be able to ask questions.

\_\_\_\_\_ If I understand more, I will do well on the test.

\_\_\_\_\_ If Mrs. Fucsko assigns homework, I will complete it.

14. Write the summary conditional:

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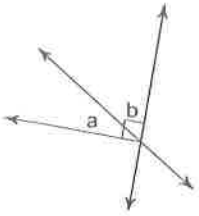
Prove #14 and #15 in two-column format.

15. Given:  $2x + 1 = 11$   
Prove  $x = 5$

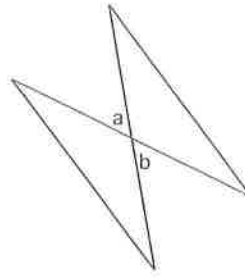
16. Given:  $3x + y = 19$   
and  $y = 7$   
Prove  $x = 4$

Name the relationship: complementary, linear pair, vertical, or adjacent.

17)

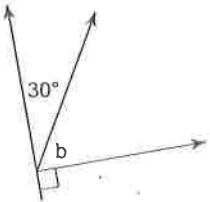


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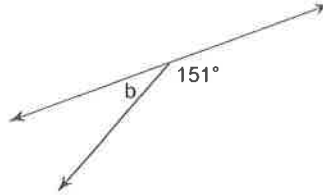


Find the measure of angle b.

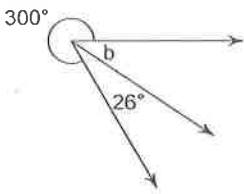
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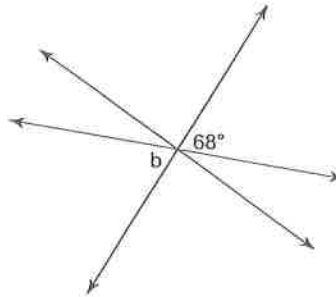
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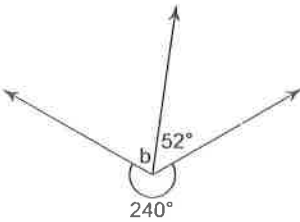
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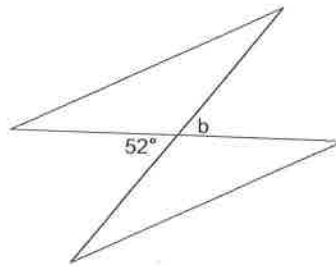
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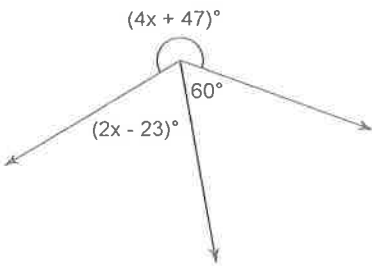


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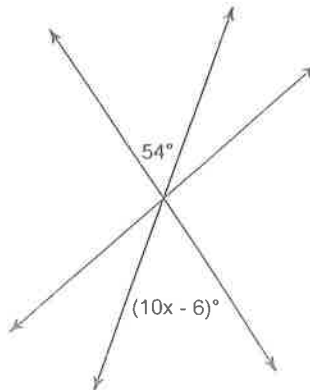


Find the value of x.

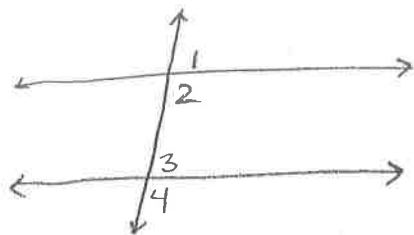
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26)



27. Fill in the missing parts of the proof. Hint: you may have to use the picture to help you find your reasons.

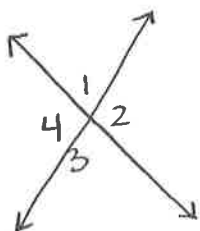


Given:  $\angle 1 \cong \angle 3$ .

Prove:  $\angle 2 \cong \angle 4$ .

Statements	Reasons
1. $m\angle 1 + m\angle 2 = 180^\circ$	
2. $m\angle 3 + m\angle 4 = 180^\circ$	
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	
4. $m\angle 1 = m\angle 3$	
5. $m\angle 2 = m\angle 4$	

28.



Given:  $m\angle 1 = 90^\circ$

Prove:  $m\angle 3 = 90^\circ$

Statements	Reasons
1. $m\angle 1 + m\angle 2 = 180^\circ$	
2. $m\angle 1 = 90^\circ$	
3. $90^\circ + m\angle 2 = 180^\circ$	
4. $m\angle 2 = 90^\circ$	
5. $m\angle 1 + m\angle 4 = 180^\circ$	
6. $90^\circ + m\angle 4 = 180^\circ$	
7. $m\angle 4 = 90^\circ$	
8. $m\angle 1 = m\angle 3$	
9. $m\angle 3 = 90^\circ$	

Find the error in each proof and explain how to correct it.

A. Given:  $2(3x+1) = 5x+14$   
 Prove:  $x=12$

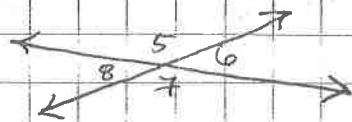
- |    |                     |                       |
|----|---------------------|-----------------------|
| 1. | $2(3x+1) = 5x+14$   | Given                 |
| 2. | $6x+2 = 5x+14$      | Distributive Property |
| 3. | $11x+2 = 14$        | Addition Property     |
| 4. | $11x = 12$          | Subtraction Property  |
| 5. | $x = \frac{12}{11}$ | Division Property     |
- QED

B. Given: Q is the midpoint of  $\overline{PR}$   
 Prove:  $\overline{PR} = 2 \cdot \overline{PQ}$



- |    |   |                                   |
|----|---|-----------------------------------|
| 1. | Q is the midpoint of $\overline{PR}$            | Given                             |
| 2. | $\overline{PQ} = \overline{QR}$                 | Definition of midpoint            |
| 3. | $\overline{PQ} + \overline{QR} = \overline{PR}$ | Substitution property of equality |
| 4. | $\overline{PQ} + \overline{PQ} = \overline{PR}$ | Substitution Property of equality |
| 5. | $2 \cdot \overline{PQ} = \overline{PR}$         | Addition property                 |
| 6. | $\overline{PR} = 2 \cdot \overline{PQ}$         | Symmetric Property                |
- ///

C. Given:  $\angle 5$  and  $\angle 6$  are a linear pair  
 Prove:  $\angle 5 \cong \angle 7$



- |    |   |                            |
|----|---|----------------------------|
| 1. | $\angle 5$ and $\angle 6$ are a linear pair     | Given                      |
| 2. | $m\angle 5 + m\angle 6 = 180^\circ$             | Linear Pair Property       |
| 3. | $m\angle 6 + m\angle 7 = 180^\circ$             | Linear Pair Property       |
| 4. | $m\angle 5 + m\angle 6 = m\angle 6 + m\angle 7$ | Transitive Property        |
| 5. | $m\angle 5 = m\angle 7$                         | Subtraction Property       |
| 6. | $\angle 5 \cong \angle 7$                       | Angle Congruence Postulate |
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# PRACTICE AND APPLICATIONS

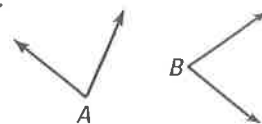
## STUDENT HELP

**Extra Practice**  
to help you master  
skills is on p. 806.

10. **PROVING THEOREM 2.2** Copy and complete the proof of the Symmetric Property of Congruence for angles.

**GIVEN**  $\angle A \cong \angle B$

**PROVE**  $\angle B \cong \angle A$

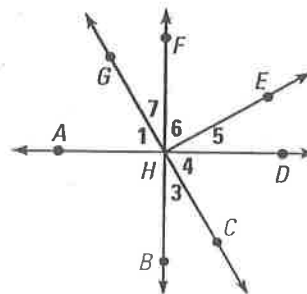


Statements	Reasons
1. $\angle A \cong \angle B$	1. ?
2. ?	2. Definition of congruent angles
3. $m\angle B = m\angle A$	3. ?
4. $\angle B \cong \angle A$	4. ?

11. **PROVING THEOREM 2.2** Write a two-column proof for the Reflexive Property of Congruence for angles.

**FINDING ANGLES** In Exercises 12–17, complete the statement given that  $m\angle EHC = m\angle DHB = m\angle AHB = 90^\circ$

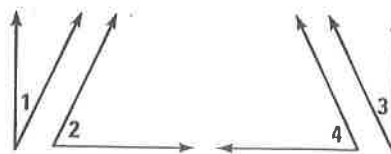
12. If  $m\angle 7 = 28^\circ$ , then  $m\angle 3 = ?$ .
13. If  $m\angle EHB = 121^\circ$ , then  $m\angle 7 = ?$ .
14. If  $m\angle 3 = 34^\circ$ , then  $m\angle 5 = ?$ .
15. If  $m\angle GHB = 158^\circ$ , then  $m\angle FHC = ?$ .
16. If  $m\angle 7 = 31^\circ$ , then  $m\angle 6 = ?$ .
17. If  $m\angle GHD = 119^\circ$ , then  $m\angle 4 = ?$ .



18. **PROVING THEOREM 2.5** Copy and complete the proof of the Congruent Complements Theorem.

**GIVEN**  $\angle 1$  and  $\angle 2$  are complements,  
 $\angle 3$  and  $\angle 4$  are complements,  
 $\angle 2 \cong \angle 4$

**PROVE**  $\angle 1 \cong \angle 3$



Statements	Reasons
1. $\angle 1$ and $\angle 2$ are complements, $\angle 3$ and $\angle 4$ are complements, $\angle 2 \cong \angle 4$	1. ?
2. ? , ?	2. Def. of complementary angles
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	3. Transitive property of equality
4. $m\angle 2 = m\angle 4$	4. ?
5. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	5. ?
6. $m\angle 1 = m\angle 3$	6. ?
7. ?	7. Definition of congruent angles

## STUDENT HELP

### HOMEWORK HELP

- Example 1: Exs. 10, 11  
Example 2: Exs. 12–17  
Example 3: Exs. 12–17  
Example 4: Exs. 19–22  
Example 5: Exs. 23–28  
Example 6: Exs. 23–28