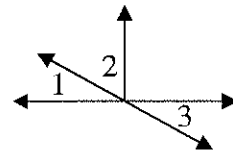
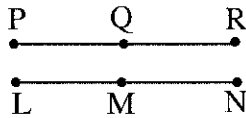
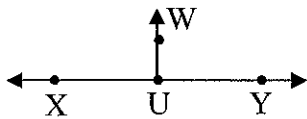
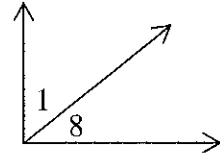
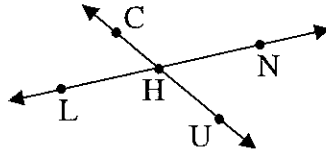
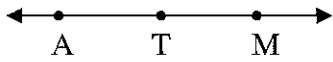


Assumptions and Justifications

Things You Can Assume From a Diagram

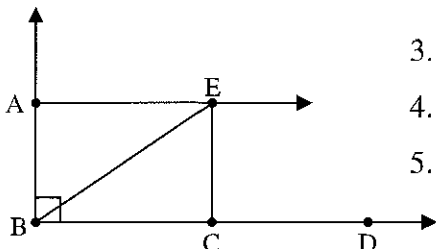
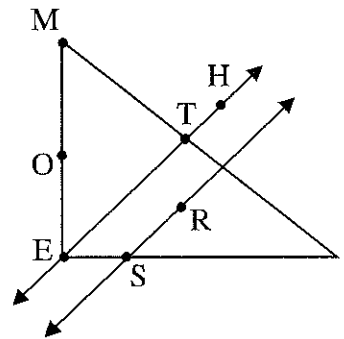
Things You CAN'T Assume From a Diagram

I. For each picture list the facts you *can* assume from it.



II. Based on the picture alone, determine if each statement is true or false.

- | | |
|--|--|
| 1. $\overleftrightarrow{ET} \parallel \overleftrightarrow{SR}$ | 5. $\overline{MO} \cong \overline{OE}$ |
| 2. $\angle MES$ is a right angle. | 6. $\angle OET \cong \angle TES$ |
| 3. T is between E and H . | 7. O and R are collinear. |
| 4. $M, O, S,$ and H are coplanar. | 8. $\angle MTH$ is a right angle. |



- | | |
|--|--|
| 1. $\angle AEB$ is an acute angle. | 6. $\angle BEC$ and $\angle ECB$ are supplementary. |
| 2. $\overline{AE} \parallel \overline{BC}$ | 7. $\angle AEB$ and $\angle BEC$ are complementary. |
| 3. $\overline{AB} \perp \overline{BC}$ | 8. C is the midpoint of \overline{BD} . |
| 4. $AB < AE$ | 9. $\angle BCE$ and $\angle ECD$ are a linear pair. |
| 5. $m\angle ECB = 90^\circ$ | 10. $\angle ABE$ and $\angle EBC$ are complementary. |

Name: _____ Period: _____

Proofs Worksheet #1

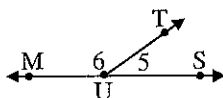
On a separate paper, write a two-column proof for each problem 1-5. Follow the plan provided for help.

1. Given: $\overline{RT} \cong \overline{SU}$
 Prove: $RS = TU$



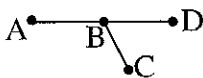
Plan: Use the definition of congruent segments to write the given information in terms of lengths. Next use the Segment Addition Postulate to write RT in terms of $RS + ST$ and SU as $ST + TU$. Substitute those into the given information and use the Subtraction Property of Equality to eliminate ST and leave $RS = TU$.

2. Given: $m\angle 5 = 47^\circ$
 Prove: $m\angle 6 = 133^\circ$



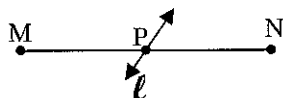
Plan: Use the Linear Pair Theorem to show that $\angle 5$ and $\angle 6$ are supplementary. Then use the definition of supplementary angles to show that their measures add up to 180° . Finally use substitution and then subtraction to arrive at the "Prove" statement.

3. Given: $AB = BC$
 $BC = BD$
 Prove: B is the midpoint of \overline{AD}



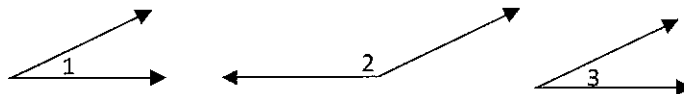
Plan: Write the "Given" information and use the transitive property to show that $AB = BD$. Then use the definition of congruence to show that the segments are congruent and the definition of midpoint to finish the proof.

4. Given: ℓ bisects \overline{MN} at P
 Prove: $MP = PN$



Plan: Use the definition of bisect to show the two smaller segments are congruent. Then use the definition of congruence to show that their lengths are equal.

5. Given: $\angle 1$ and $\angle 2$ are supplementary;
 $\angle 1 \cong \angle 3$
 Prove: $\angle 3$ and $\angle 2$ are supplementary



Plan: Use the definition of supplementary angles and congruent angles to write the given information in terms of angle measures. Next use substitution to show that $m\angle 3 + m\angle 2 = 180^\circ$. Then use the definition of supplementary angles for the conclusion.

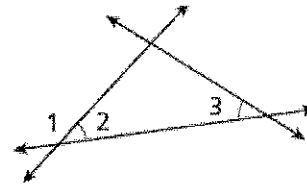
P 113 (4, 7, 8)

4. Fill in the blanks to complete the two-column proof.

Given: $\angle 2 \cong \angle 3$

Prove: $\angle 1$ and $\angle 3$ are supplementary.

Proof:



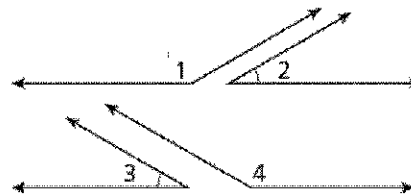
Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. Given
2. $m\angle 2 = m\angle 3$	2. a. <u> ?</u>
3. b. <u> ?</u>	3. Lin. Pair Thm.
4. $m\angle 1 + m\angle 2 = 180^\circ$	4. Def. of supp. \triangle
5. $m\angle 1 + m\angle 3 = 180^\circ$	5. c. <u> ?</u> Steps 2, 4
6. d. <u> ?</u>	6. Def. of supp. \triangle

Fill in the blanks to complete each two-column proof.

7. Given: $\angle 1$ and $\angle 2$ are supplementary, and
 $\angle 3$ and $\angle 4$ are supplementary.
 $\angle 2 \cong \angle 3$

Prove: $\angle 1 \cong \angle 4$

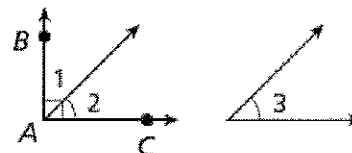
Proof:



Statements	Reasons
1. $\angle 1$ and $\angle 2$ are supplementary. $\angle 3$ and $\angle 4$ are supplementary.	1. Given
2. a. <u> ?</u>	2. Def. of supp. \triangle
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	3. b. <u> ?</u>
4. $\angle 2 \cong \angle 3$	4. Given
5. $m\angle 2 = m\angle 3$	5. Def. of $\cong \triangle$
6. c. <u> ?</u>	6. Subtr. Prop. of = Steps 3, 5
7. $\angle 1 \cong \angle 4$	7. d. <u> ?</u>

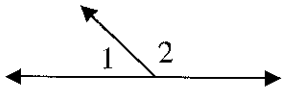
8. Given: $\angle BAC$ is a right angle. $\angle 2 \cong \angle 3$
 Prove: $\angle 1$ and $\angle 3$ are complementary.

Proof:



Statements	Reasons
1. $\angle BAC$ is a right angle.	1. Given
2. $m\angle BAC = 90^\circ$	2. a. <u> ?</u>
3. b. <u> ?</u>	3. \angle Add. Post.
4. $m\angle 1 + m\angle 2 = 90^\circ$	4. Subst. Steps 2, 3
5. $\angle 2 \cong \angle 3$	5. Given
6. c. <u> ?</u>	6. Def. of $\cong \triangle$
7. $m\angle 1 + m\angle 3 = 90^\circ$	7. d. <u> ?</u> Steps 4, 6
8. e. <u> ?</u>	8. Def. of comp. \triangle

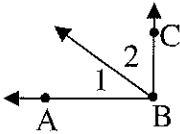
13.



Given: $m\angle 2 = 2(m\angle 1)$

Prove: $m\angle 1 = 60^\circ$

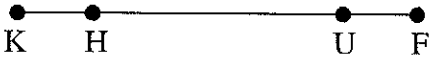
15.



Given: $\angle ABC$ is a right angle

Prove: $\angle 1$ and $\angle 2$ are complementary

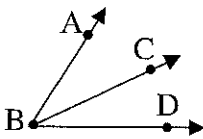
17.



Given: $KU = HF$

Prove: $\overline{KH} \cong \overline{UF}$

19.



Given: $m\angle ABC = m\angle CBD$

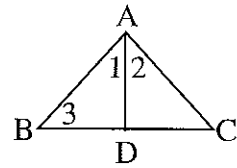
Prove: \overline{BC} is the angle bisector of $\angle ABD$

14.

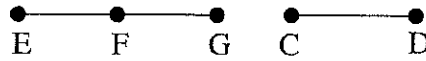
Given: \overline{AD} bisects $\angle BAC$

$\angle 1 \cong \angle 3$

Prove: $\angle 2 \cong \angle 3$



16.

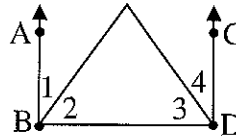


Given: $\overline{CD} \cong \overline{EF}$

$\overline{CD} \cong \overline{FG}$

Prove: F is the midpoint of \overline{EG}

18.

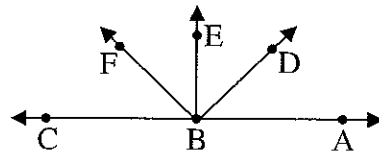


Given: $\angle ABD$ and $\angle CDB$ are right angles

$m\angle 2 = m\angle 4$

Prove: $m\angle 1 = m\angle 3$

20.



Given: $m\angle ABE = m\angle CBE$

Prove: $\angle ABD$ and $\angle DBE$ are complementary