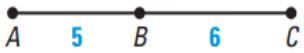
Geometry- Mrs. Tilus Name: _____

Unit 2- Worksheet #6: Prove Segment and Angle Statements

1. What is a theorem? How is it different from a postulate?

Complete the proof.

2. **Given:** $AB = 5, BC = 6$
   Prove: $AC = 11$



Statement	Reason
1. $AB = 5, BC = 6$	1. _____
2. $AC = AB + BC$	2. _____
3. $AC = 5 + 6$	3. _____
4. _____	4. _____

3. **Given:** $m\angle 1 = 59°, m\angle 2 = 59°$
   Prove: $m\angle 1 = m\angle 2$

Statement	Reason
1. $m\angle 1 = 59°, m\angle 2 = 59°$	1. _____
2. $59° = m\angle 2$	2. _____
3. _____	3. _____

Use the property to complete the statement.

4. Reflexive Property of Congruence: _____$\cong \overline{SE}$

5. Symmetric Property of Congruence: If _____$\cong$_____, then $\angle RST \cong \angle JKL$

6. Transitive Property of Congruence: If $\angle F \cong \angle J$ and _____$\cong$_____, then $\angle F \cong \angle L$

Name the property illustrated by the statement.

7. If $\overline{DG} \cong \overline{CT}$, then $\overline{CT} \cong \overline{DG}$

8. $\angle VWX \cong \angle VWX$

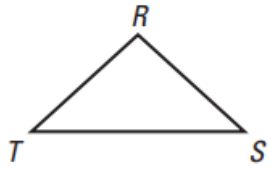
9. If $\overline{JK} \cong \overline{MN}$ and $\overline{MN} \cong \overline{XY}$, then $\overline{JK} \cong \overline{XY}$

10. $YZ = ZY$

11. Sketch a diagram that represents the given information: You are on vacation at the beach. Along the boardwalk, the bike rentals are halfway between your cottage and the kite shop. The snack shop is halfway between your cottage and the bike rentals. The arcade is halfway between the bike rentals and the kite shop.

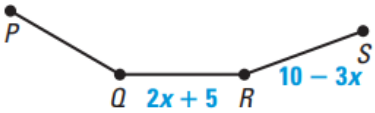
Complete the proof.

12. **Given:** $RT = 5, RS = 5, \overline{RT} \cong \overline{TS}$
Prove: $\overline{RS} \cong \overline{TS}$



Statement	Reason
1. _____	1. _____
2. $RS = RT$	2. _____
3. $RT = TS$	3. _____
4. $RS = TS$	4. _____
5. _____	5. _____

13. **Given:** $\overline{QR} \cong \overline{PQ}, \overline{RS} \cong \overline{PQ}$
Prove: Solve for *x*



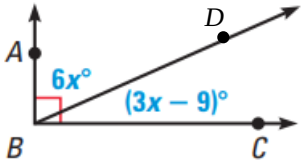
Statement	Reason
1. _____	1. _____
2. $\overline{QR} \cong \overline{RS}$	2. _____
3. $QR = RS$	3. _____
4. $2x + 5 = 10 - 3x$	4. _____
5. _____	5. _____
6. _____	6. Substitution
7. _____	7. _____
8. _____	8. Substitution
9. _____	9. _____
10. _____	10. _____

14. Point P is the midpoint of $\overline{MN}$ and point Q is the midpoint of $\overline{MP}$. Suppose $\overline{AB}$ is congruent to $\overline{MP}$, and $\overline{PN}$ has length *x*. Write the length of the segments in terms of *x*- **Include your reasoning.** (Use a sketch if you need)

a.) $\overline{AB}$ b.) $\overline{MN}$ c.) $\overline{MQ}$

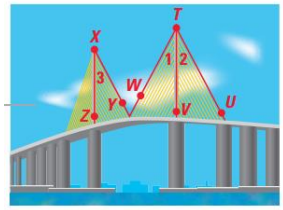
15. Complete the proof.

Given: $m\angle ABC = 90°$
Prove: Solve for x



Statement	Reason
1. _____	1. _____
2. $m\angle ABC = m\angle ABD + m\angle DBC$	2. _____
3. _____	3. Substitution
4. $90 = 9x - 9$	4. Substitution
5. _____	5. _____
6. _____	6. Substitution
7. _____	7. _____
8. _____	8. Substitution

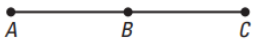
16. In the bridge in the illustration, it is known that $\angle 2 \cong \angle 3$ and $\overrightarrow{TV}$ bisects $\angle UTW$. Complete the proof to show that $\angle 1 \cong \angle 3$



Statement	Reason
1. $\overrightarrow{TV}$ bisects $\angle UTW$	1. _____
2. $\angle 1 \cong \angle 2$	2. _____
3. $\angle 2 \cong \angle 3$	3. _____
4. _____	4. _____

17. Complete the proof.

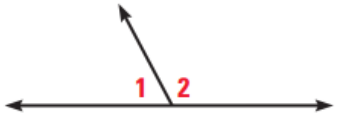
Given: 2AB=AC
Prove: AB=BC



Statement	Reason
1. _____	1. _____
2. _____	2. Segment Addition Postulate
3. _____	3. _____
4. _____	4. Subtraction Prop of Equality
5. _____	5. Substitution

18. Complete the proof.

Given: $m\angle 1 + m\angle 2 = 180°$
$m\angle 1 = 62°$
Prove: $m\angle 2 = 118°$



Statement	Reason
1. _____	1. _____
1. _____	
2. _____	2. Substitution
3. _____	3. Subtraction Prop of Equality
4. _____	4. Substitution

19. Explain why writing a proof is an example of deductive reasoning, not inductive reasoning.

20. Write a complete proof by matching each statement with its corresponding reason.

Given: $\overrightarrow{QS}$ is an angle bisector of $\angle PQR$

Prove: $\angle PQS = \frac{1}{2}\angle PQR$

STATEMENTS	REASONS
1. $\overrightarrow{QS}$ is an angle bisector of $\angle PQR$.	A. Definition of angle bisector
2. $\angle PQS \cong \angle SQR$	B. Distributive Property
3. $m\angle PQS = m\angle SQR$	C. Angle Addition Postulate
4. $m\angle PQS + m\angle SQR = m\angle PQR$	D. Given
5. $m\angle PQS + m\angle PQS = m\angle PQR$	E. Division Property of Equality
6. $2 \cdot m\angle PQS = m\angle PQR$	F. Definition of congruent angles
7. $m\angle PQS = \frac{1}{2}m\angle PQR$	G. Substitution Property of Equality

Statement	Reason
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____
6. _____	6. _____
7. _____	7. _____