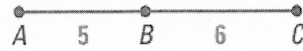


1. What is a theorem? How is it different from a postulate?

See notes.

Complete the proof.

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



Statement	Reason
1. $AB = 5, BC = 6$	1. <u>Given</u>
2. $AC = AB + BC$	2. <u>Segment Addition</u>
3. $AC = 5 + 6$	3. <u>Substitution</u>
4. <u>$AC = 11$</u>	4. <u>Substitution</u>

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

Statement	Reason
1. $m\angle 1 = 59^\circ, m\angle 2 = 59^\circ$	1. <u>Given</u>
2. $59^\circ = m\angle 2$	2. <u>Symmetric Property</u>
3. <u>$m\angle 1 = m\angle 2$</u>	3. <u>Transitive Prop.</u>

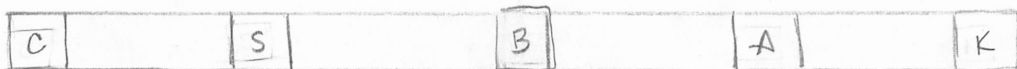
Use the property to complete the statement.

4. Reflexive Property of Congruence: $\overline{SE} \cong \overline{SE}$
5. Symmetric Property of Congruence: If $\angle JKL \cong \angle RST$, then $\angle RST \cong \angle JKL$
6. Transitive Property of Congruence: If $\angle F \cong \angle J$ and $\angle J \cong \angle L$, then $\angle F \cong \angle L$

Name the property illustrated by the statement.

7. If $\overline{DG} \cong \overline{CT}$, then $\overline{CT} \cong \overline{DG}$
Symmetric Property
8. $\angle VWX \cong \angle VWX$
Reflexive Property
9. If $\overline{JK} \cong \overline{MN}$ and $\overline{MN} \cong \overline{XY}$, then $\overline{JK} \cong \overline{XY}$
Transitive Property
10. $YZ = ZY$
Reflexive Property

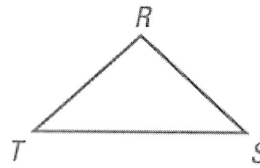
11. Sketch a diagram that represents the given information: You are on vacation at the beach. Along the boardwalk, the bike rentals are halfway between your cottage and the kite shop. The snack shop is halfway between your cottage and the bike rentals. The arcade is halfway between the bike rentals and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



Complete the proof.

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

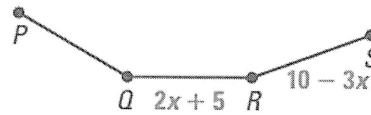
Prove: $\overline{RS} \cong \overline{TS}$



Statement	Reason
1. $RT = 5, RS = 5, \overline{RT} \cong \overline{TS}$	1. Given
2. $RS = RT$	2. Def ⁿ of congruent segments
3. $RT = TS$	3. Transitive Property
4. $RS = TS$	4. Transitive Property
5. $\overline{RS} \cong \overline{TS}$	5. Def ⁿ of Congruent Segments

13. **Given:** $\overline{QR} \cong \overline{PQ}, \overline{RS} \cong \overline{PQ}$

Prove: Solve for x



Statement	Reason
1. $\overline{QR} \cong \overline{PQ}, \overline{RS} \cong \overline{PQ}$	1. Given
2. $\overline{QR} \cong \overline{RS}$	2. Transitive Property
3. $QR = RS$	3. Def ⁿ of congruent segments
4. $2x + 5 = 10 - 3x$	4. Substitution
5. $\begin{array}{r} +3x \\ \hline \end{array}$	5. Addition Property
6. $5x + 5 = 10$	6. Substitution
7. $\begin{array}{r} -5 \\ \hline \end{array}$	7. Subtraction Property
8. $5x = 5$	8. Substitution
9. $\begin{array}{r} \overline{5} \\ \hline \end{array}$	9. Division Property
10. $x = 1$	10. Substitution

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

See notes.

15. 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.) $\overline{AB} = x$

b.) $\overline{MN} = 2x$

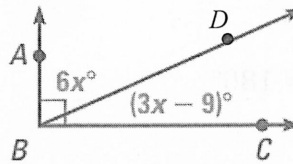
c.) $\overline{MQ} = \frac{1}{2}x$



16. Complete the proof.

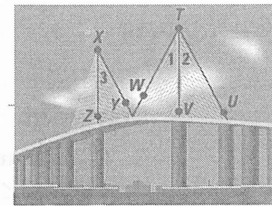
Given: $m\angle ABC = 90^\circ$

Prove: Solve for x



Statement	Reason
1. $m\angle ABC = 90^\circ$	1. Given
2. $m\angle ABC = m\angle ABD + m\angle DBC$	2. Angle Addition
3. $90^\circ = 6x + 3x - 9$	3. Substitution
4. $90 = 9x - 9$	4. Substitution
5. $+9 \quad +9$	5. Addition Property
6. $99 = 9x$	6. Substitution
7. $\frac{99}{9} \quad \frac{9x}{9}$	7. Division Property
8. $11 = x$	8. Substitution

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

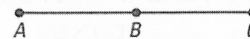


Statement	Reason
1. \overline{TV} bisects $\angle UTW$	1. Given
2. $\angle 1 \cong \angle 2$	2. Def ⁿ of Angle Bisector
3. $\angle 2 \cong \angle 3$	3. Given
4. $\angle 1 \cong \angle 3$	4. Transitive Property

18. Complete the proof.

Given: $2AB = AC$

Prove: $AB = BC$



Statement	Reason
1. $2AB = AC$	1. Given
2. $AC = AB + BC$	2. Segment Addition Postulate
3. $2AB = AB + BC$	3. Transitive Property
4. $-AB \quad -AB$	4. Subtraction Prop of Equality
5. $AB = BC$	5. Substitution

19. Complete the proof.

Given: $m\angle 1 + m\angle 2 = 180^\circ$

$m\angle 1 = 62^\circ$

Prove: $m\angle 2 = 118^\circ$



Statement	Reason
1. $m\angle 1 + m\angle 2 = 180^\circ$	1. <u>Given</u>
1. $m\angle 1 = 62^\circ$	2. Substitution
2. $62^\circ + m\angle 2 = 180^\circ$	3. Subtraction Prop of Equality
3. -62° -62°	4. Substitution
4. $m\angle 2 = 118^\circ$	

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. \overrightarrow{QS} is an angle bisector of $\angle PQR$	1. <u>Given (D)</u>
2. $\angle PQS \cong \angle SQR$	2. <u>Defⁿ of Angle Bisector (A)</u>
3. $m\angle PQS = m\angle SQR$	3. <u>Defⁿ of Congruent Angles (F)</u>
4. $m\angle PQS + m\angle SQR = m\angle PQR$	4. <u>Angle Addition Postulate (C)</u>
5. $m\angle PQS + m\angle PQS = m\angle PQR$	5. <u>Substitution Property (G)</u>
6. $2 \cdot m\angle PQS = m\angle PQR$	6. <u>Distributive Property (B)</u>
7. $m\angle PQS = \frac{1}{2}m\angle PQR$	7. <u>Division Property (E)</u>