Geometry, Ch 2-6, Exer. pg 108, #1-3, 5-11, 14-15, 17-19, 23-24

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

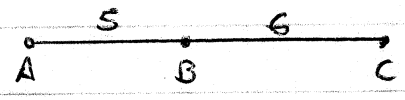
   A theorem is a statement that can be proven, while a postulate is accepted without proof.

2. Besides theorems, what type of statement may be used in a 2-column proof?
   - Definitions
   - Given information
   - Properties
   - Postulates

3. Copy and complete the proof:

   GIVEN: AB = 5, BC = 6

   PROVE: AC = 11



Statement	Reason
AB = 5, BC = 6	Given
AC = AB + BC	Segment Add'n
AC = 5 + 6	Substitution
AC = 11	Simplify

Use the property to copy and complete each sentence.

5. Reflexive Prop: $\overline{SE}$ $\cong$ $\overline{SE}$

6. Symmetric Prop: If $\angle JKL \cong \angle RST$, then $\angle RST \cong \angle JKL$.

7. Transitive Prop: If $\angle F \cong \angle J$, and $\angle J \cong \angle L$,
then $\angle F \cong \angle L$.

Name the property illustrated by each statement.

8. If $\overline{DG} \cong \overline{CT}$, then $\overline{CT} \cong \overline{DG}$ Symmetric Property

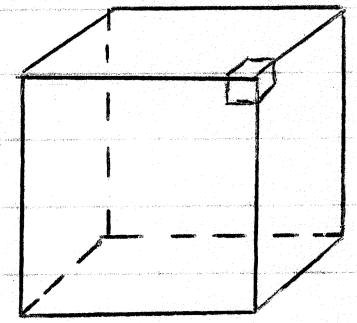
9. $\angle VWX \cong \angle VWX$ Reflexive Property of Congruence

10. If $\overline{JK} \cong \overline{MN}$ and $\overline{MN} \cong \overline{XY}$,
then $\overline{JK} \cong \overline{XY}$ Transitive Property

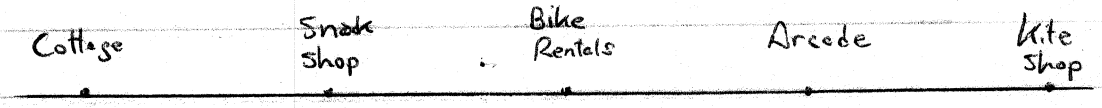
11. $YZ = ZY$ Reflexive Property of Equality

Sketch a diagram that represents the given info.

14. The shape of a crystal can be represented by intersecting lines and planes. Suppose a crystal is CUBIC, meaning it can be represented by 6 planes that intersect at right angles.



15. Along the boardwalk, 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.

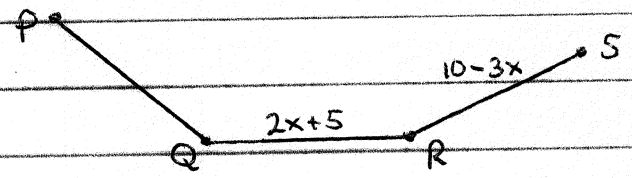


If Cottage to Snack Shop is 150 feet, how far is Kite Shop from Bike Rentals? 300 ft

ALGEBRA: Solve for X using the given info. Explain.

17. Given: $\overline{QR} \cong \overline{PQ}$

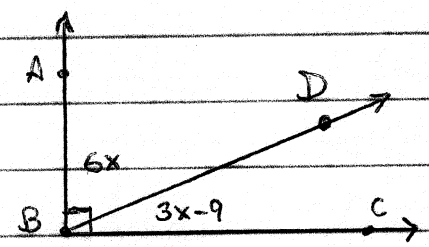
$\overline{RS} \cong \overline{PQ}$



Since $\overline{PQ}$ is $\cong$ to both $\overline{QR}$ and $\overline{RS}$, by the Transitive Property we know $QR = RS$

$$2x+5 = 10-3x$$
$$5x = 5$$
$$x = 1$$

18. Given: $m\angle ABC = 90°$



Using Angle Add'n, $\angle ABD + \angle DBC = \angle ABC$

Subs. with given info: $(6x) + (3x-9) = (90)$

$$9x - 9 = 90$$
$$9x = 99$$
$$x = 11$$

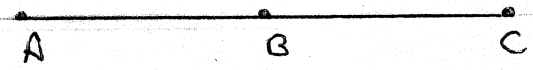
19. Explain why writing a proof is an example of Deductive, and not Inductive, Reasoning.

Proofs use facts, postulates, theorems, etc., and does not rely on the observation of a pattern.

Use given info to write a 2-column proof.

23. Given: $2AB = AC$

Prove: $AB = BC$

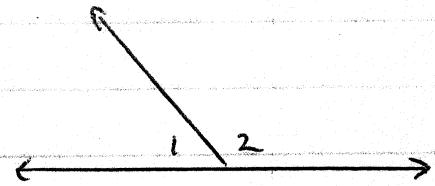


	Statement	Reason
Part 1	$2AB = AC$	Given
	$AB + AB = AC$	Substitution [un-simplify?]
	$AB = AC - AB$	Subtraction Prop.
Part 2	$AB + BC = AC$	Segment Add'n
	$BC = AC - AB$	Subtraction Prop
	$AB = BC$	Transitive Prop.

24. Given: $\angle 1 + \angle 2 = 180°$

$\angle 1 = 62°$

Prove: $\angle 2 = 118°$



Statement	Reason
$\angle 1 + \angle 2 = 180°$	Given
$\angle 1 = 62°$	Given
$62° + \angle 2 = 180°$	Substitution
$\angle 2 = 118°$	Subt. Prop.