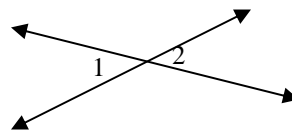


1. Name the type of reasoning illustrated: (intuition, deduction or induction)
  - a. While watching the pitcher warm up, Phil thinks, "I'll be able to hit against him."
  - b. Drug XYZ was administered to 1000 patients suffering from severe hypertension (high blood pressure). At the end of six months, 87% of the patients have normal blood pressure. It was concluded that XYZ cures hypertension.
  - c. Sarah knows that "A number is divisible by 9 if the sum of its digits is divisible by 9". Her teacher gave her the number 5238. Sarah concluded that the number is divisible by 9.
2. State the hypothesis and conclusion of each statement.
  - a. The diagonals of a quadrilateral bisect each other if the quadrilateral is a parallelogram.
  - b. If a bird is a penguin, then it can swim and fly.
3. Draw a valid conclusion where possible. Otherwise, state no valid conclusion.
  - a. All athletes in the Baseball Hall of Fame are great baseball players. Hank Aaron is in Baseball Hall of Fame.
  - b. If the quadrilateral is a rectangle, then their diagonals are congruent. The diagonals of quadrilateral ABCD are congruent.
4. State the following:
  - a. Definition of Supplementary Angles
  - b. Definition of Complementary Angles
  - c. Definition of Parallel Lines
  - d. Definition of Perpendicular Lines
  - e. Definition of Vertical Angles
  - f. Ruler Postulate
  - g. Protractor Postulate
  - h. Segment Addition Postulate
  - i. Angle Addition Postulate
5. State whether the statements are always true (A), sometimes true (S), or never true (N).
  - a. Supplementary angles are congruent.
  - b. The bisectors of vertical angles are opposite rays.
  - c. The complement of an angle is an obtuse angle.
  - d. If two lines are perpendicular to the same line, then the two lines are parallel.
  - e. If two lines are parallel to the same plane, then the two lines are parallel.

6. Two angles are supplementary. One angle is  $40^\circ$  more than four times the other. Find the measures of the two angles.

7. Given:  $AM = 3x - 1$ ,  $MB = 4x - 5$ , M is the midpoint of  $\overline{AB}$ , find AB.

8. If  $m\angle 1 = x + 15$  and  $m\angle 2 = 2x$ , find  $x$  and  $m\angle 1$ .

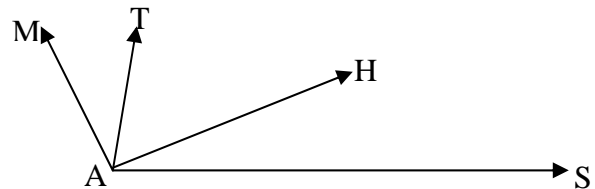


9. Construct the following:

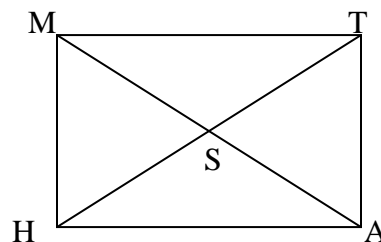
- a. An angle of measure  $135^\circ$
- b. Three angle bisectors of an obtuse triangle.

10. Write two-column proof.

Given:  $m\angle MAH = m\angle TAS$   
 Prove:  $m\angle MAT = m\angle HAS$



11. Given:  $\overline{MA} \cong \overline{TH}$ , S is the midpoint of both  $\overline{MA}$  and  $\overline{TH}$   
 Prove:  $\overline{MS} \cong \overline{ST}$



**Answer Key:**

1.
  - a. intuition
  - b. induction
  - c. deduction
2.
  - a. Hypothesis: A quadrilateral is a parallelogram.  
Conclusion: The diagonals of the quadrilateral bisect each other.
  - b. Hypothesis: A bird is a penguin.  
Conclusion: It can swim and fly.
3.
  - a. Hank Aaron is a great baseball player.
  - b. No valid conclusion.
4.
  - a. Supplementary angles are two angles such that the sum of their measures is  $180^\circ$ .
  - b. Complementary angles are two angles such that the sum of their measures is  $90^\circ$ .
  - c. Parallel lines are coplanar lines that never intersect.
  - d. Perpendicular lines are lines that meet to form congruent adjacent angles.
  - e. Vertical angles are the nonadjacent angles formed when two lines intersect.
  - f. The measure (length) of a line segment is a unique positive real number.
  - g. The measure of an angle is a unique positive real number.
  - h. If A-B-C then  $AB + BC = AC$
  - i. If  $D$  lies in the interior of  $\angle ABC$ , then  $m\angle ABD + m\angle DBC = m\angle ABC$ .
5.
  - a. S
  - b. A
  - c. N
  - d. S
  - e. S
6. The measures of the supplementary angles are  $28^\circ$  and  $152^\circ$
7.  $AB = 22$
8.  $x = 15$ ,  $m\angle 1 = 30^\circ$
9. Will do in class.

10. Proof:

STATEMENTS	REASONS
1. $m\angle MAH = m\angle TAS$	1. Given
2. $m\angle MAH = m\angle MAT + m\angle TAH$ $m\angle TAS = m\angle TAH + m\angle HAS$	2. Angle Addition Postulate
3. $m\angle MAT + m\angle TAH = m\angle TAH + m\angle HAS$	3. Substitution
4. $m\angle MAT = m\angle HAS$	4. Subtraction Property of Equality

11. Proof:

STATEMENTS	REASONS
1. $\overline{MA} \cong \overline{TH}$	1. Given
2. $\overline{MS} \cong \overline{SA}$ , $\overline{HS} \cong \overline{ST}$	2. Definition of midpoint
3. $MA = TH$ , $MS = SA$ , $HS = ST$	3. Definition of congruent segments.
4. $MS + SA = MA$ , $HS + ST = HT$	4. Segment Addition Postulate
5. $MS + MS = MA$ , $ST + ST = HT$	5. Substitution (3 into 4)
6. $2MS = MA$ , $2ST = HT$	6. Distributive Property
7. $2MS = 2ST$	7. Substitution (6 into 3)
8. $MS = ST$	8. Subtraction Property of Equality
9. $\overline{MS} \cong \overline{ST}$	9. Definition of congruent segments