

NOTES SECTION 3.6: INDUCTIVE REASONING**CONCLUSION 1**

On each of the first six days Jim attended his geometry class, Mrs. Lee, his geometry teacher, gave a homework assignment. Jim concludes that he will have geometry homework every day he has geometry class.

CONCLUSION 2

In the same geometry class, Maria reads the theorem "Vertical angles are congruent." She notices in a diagram that $\angle 1$ and $\angle 2$ are vertical angles. Maria concludes that $\angle 1 \cong \angle 2$.

INDUCTIVE REASONING

- Reach conclusions based on several past observations
- The conclusion is sometimes, but not always true
- Conclusion 1 above is an example of inductive reasoning.

DEDUCTIVE REASONING

- Reach conclusions based on accepted statements, including previous theorems, postulates, definitions, and given information
- The conclusion must be true if the hypotheses are true.
- Conclusion 2 above is an example of deductive reasoning.

I-3: Tell whether the reasoning process is deductive or inductive.

- 1) Jose did his assignment and found the sums of the exterior angles of several different polygons. Noticing the results were all the same, he concludes that the sum of the measures of the exterior angles of any polygon is 360° .
- 2) Lara is told that $m(\angle A) = 150$ and $m(\angle B) = 30$. Since she knows the definition of supplementary angles, she concludes that $\angle A$ and $\angle B$ are supplementary.
- 3) Kim observes that the sum of 2 and 4 is an even number, that the sum of 4 and 6 is an even number, and that the sum of 12 and 6 is also an even number. She concludes that the sum of two even numbers is always an even number.

EXAMPLE 3

Look for a pattern and predict the next two numbers in each sequence.

a) 81, 27, 9, 3,...

b) 1, 3, 7, 13, 21,...

4-9: Look for a pattern and predict the next two numbers in each sequence.

4) 2, 4, 8, 16, 32,...

5) 1, 5, 9, 13,...

6) 3, 9, 27, 81,...

7) 3, 4, 6, 9, 13,...

8) 64, 16, 4, 1,...

9) 3, -6, 12, -24,...

EXAMPLE 4

Accept the two statements as given information. State a conclusion based on deductive reasoning. If no conclusion can be reached, write *no conclusion*.

a) All cows eat grass.
Blossom eats grass.

b) Rafael is taller than Emily.
Emily is taller than Dave.

10-15: Accept the two statements as given information. State a conclusion based on deductive reasoning. If no conclusion can be reached, write *no conclusion*.

10) $\angle A \cong \angle B$
 $m(\angle A) = 72$

11) All football tackles weigh
at least 200 pounds.
Eric weighs 210 pounds.

12) Polygon X has fewer than 10
sides.
Polygon X has more than 8
sides.

13) Elephants eat a lot.
Jumbo is an elephant.

14) $\overline{AB} \parallel \overline{CD}$
 $\overline{CD} \parallel \overline{EF}$

15) $\overline{AB} \parallel \overline{CD}$
 $\overline{AB} \perp \overline{XY}$