Scan the lesson. List two headings you would use to make an outline of the lesson.

- **The Proof Process** _____

- **Two-Column Proofs** _____

_____

Complete the graphic organizer by matching each situation with the type of reasoning used.

Every time Bill watches his favorite team on television, the team loses. So, he decides to not watch the team play on TV.

In order to play sports, you need to have a B average. Simon has a B average, so he concludes he can play sports.

All triangles have 3 sides and 3 angles. Mariah has a figure with 3 sides and 3 angles, so it must be a triangle.

After performing a science experiment, LaDell concluded that only 80% of tomato seeds would grow into plants.

Deductive Reasoning

Inductive Reasoning

The Proof Process

Step 1 List the given information, or what you know. If possible, draw a diagram to illustrate this information.

Step 2 State what is to be proven.

Step 3 Create a deductive argument by forming a logical chain of statements linking the given information to what you are trying to prove.

Step 4 Justify each statement with a reason. Reasons include definitions, algebraic properties, and theorems.

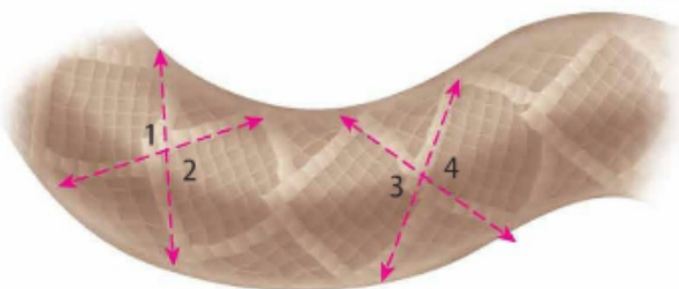**Step 5** State what it is you have proven.

Given

↓

Hypothesis

↓

Statements and Reasons

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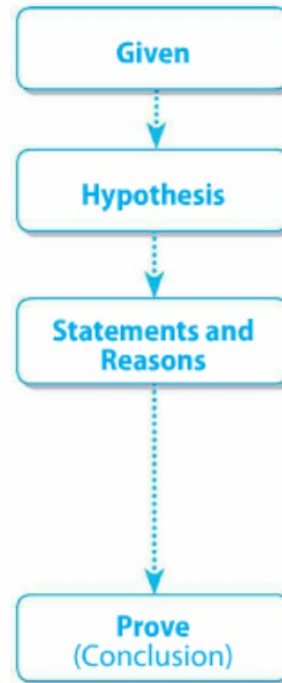
Prove
(Conclusion)

1. The diamondback rattlesnake has a diamond pattern on its back. An enlargement of the skin is shown. If $m\angle 1 = m\angle 4$, write a paragraph proof to show that $m\angle 2 = m\angle 3$.

Given: $m\angle 1 = m\angle 4$

Prove: $m\angle 2 = m\angle 3$

Proof: $m\angle 1 = m\angle 2$ because they are vertical angles. Since $m\angle 1 = m\angle 4$, $m\angle 2 = m\angle 4$ by substitution. $m\angle 4 = m\angle 3$ because they are vertical angles. Since $m\angle 2 = m\angle 4$, then $m\angle 2 = m\angle 3$ also by substitution. Therefore, $m\angle 2 = m\angle 3$.

a. Refer to the diagram shown. $AR = CR$ and $DR = BR$. Write a paragraph proof to show that $AR + DR = CR + BR$.
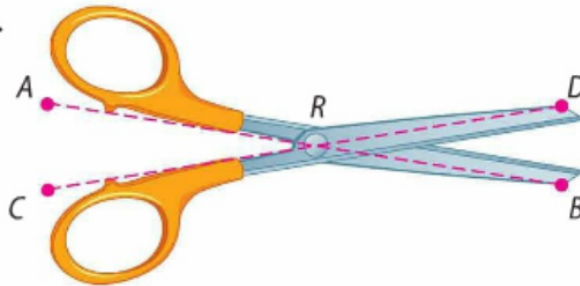
Given: $AR = $ _CR_ and

$DR = $ _BR_.

Prove: _AR + DR_ $= CR + BR$.

Proof: You know that $AR = CR$ and $DR = BR$.
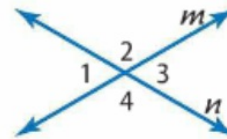
$AR + DR = CR + DR$ by the _Addition_ Property of Equality. So, $AR + DR = CR + BR$ by _substitution_.

2. Write a two-column proof to show that if two angles are vertical angles, then they have the same measure.

Given: lines m and n intersect; $\angle 1$ and $\angle 3$ are vertical angles

Prove: $m\angle 1 = m\angle 3$

	Statements	Reasons
a.	lines m and n intersect; $\angle 1$ and $\angle 3$ are vertical angles.	Given
b.	$\angle 1$ and $\angle 2$ are a linear pair and $\angle 3$ and $\angle 2$ are a linear pair.	Definition of linear pair
c.	$m\angle 1 + m\angle 2 = 180°$ $m\angle 3 + m\angle 2 = 180°$	Definition of supplementary angles
d.	$m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	Substitution
e.	$m\angle 1 = m\angle 3$	Subtraction Property of Equality

Linear Pair

A linear pair of angles is a pair of adjacent angles formed by intersecting lines.