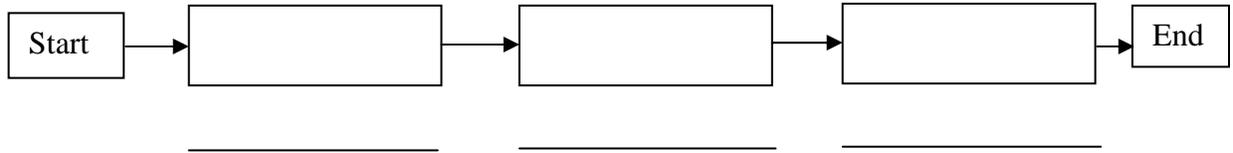


Introduction to Two-Column Proof

1. a. Solve the following equation.

$$5x - 28 = 57$$

- b. Draw a flowchart showing the steps and reasons for each step in solving the equation.



- c. Write a paragraph explaining the steps needed to solve the equation and justifying each step.

- d. Fill in the chart below showing the steps for solving the equation.

Statements	Reasons

A **two-column statement-reason proof** resembles the chart used to show the solution to the equation above. The statements are listed in logical order on the left side and the reason each statement is true is on the right side. The last statement is always what is being proven.

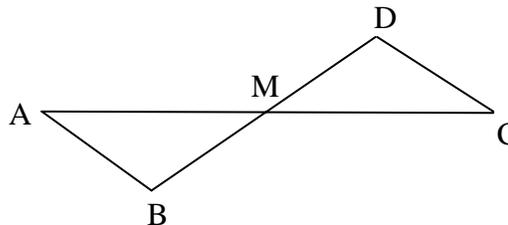
Introduction to Two-Column Proof (Continued)

2. If \overline{AC} and \overline{BD} bisect each other at M then $\triangle AMB \cong \triangle CMD$.

a. Complete the following:

Given:

Prove:



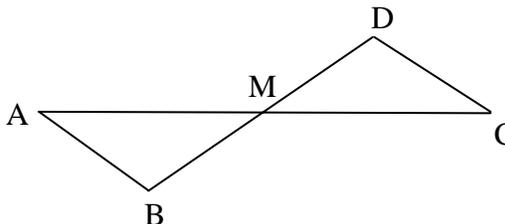
b. Mark the diagram with the given information.

The paragraph proof would be written as follows:

Since it is given that \overline{AC} and \overline{BD} bisect each other at M then $\overline{AM} \cong \overline{MC}$ and $\overline{BM} \cong \overline{MD}$ by the definition of bisect. $\angle AMB \cong \angle CMD$ since vertical angles are congruent. Therefore $\triangle AMB \cong \triangle CMD$ by Side-Angle-Side congruence.

c. This paragraph proof can be represented in a two-column statement-reason proof. The statements in logical order needed for the proof are already entered. Fill in each missing reason below.

Given:



Prove:

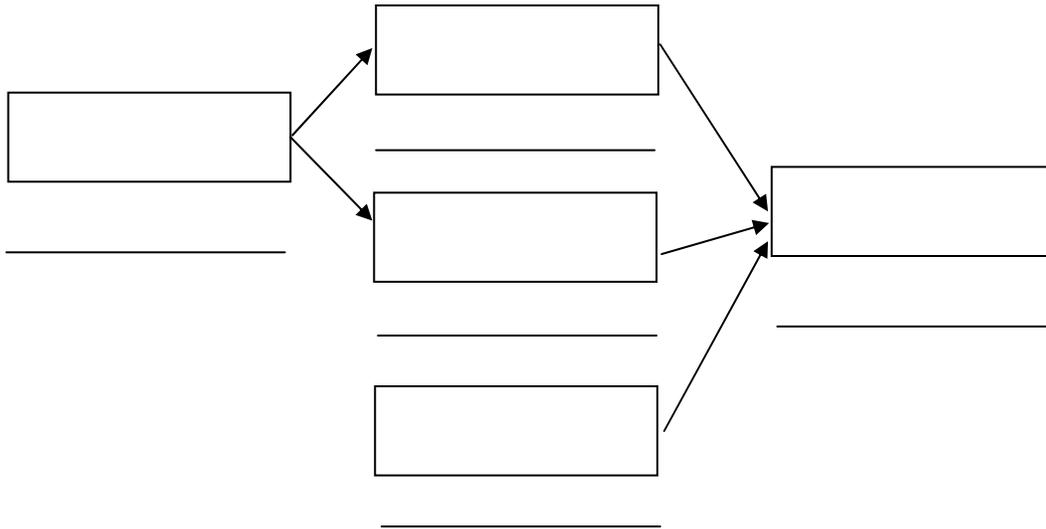
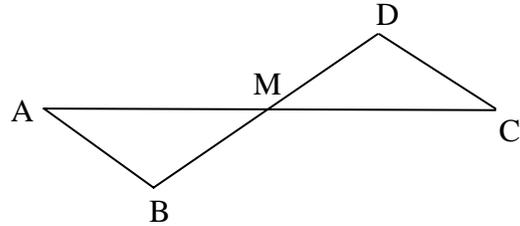
Statements	Reasons
1. \overline{AC} and \overline{BD} bisect each other at M	1.
2. $\overline{AM} \cong \overline{MC}$	2.
3. $\overline{BM} \cong \overline{MD}$	3.
4. $\angle AMB \cong \angle CMD$	4.
5. $\triangle AMB \cong \triangle CMD$	5.

Introduction to Two-Column Proof (Continued)

- d. Below is the outline of a flow chart proof for the same given and prove. Fill in the boxes and reasons to complete the proof.

Given:

Prove:



3. Which of the three types of proof, flow-chart, paragraph, or two-column, is easiest for you to understand? Explain.

Answers:

1. a. $x = 17$

$5x - 28 = 57$	$5x = 85$	$x = 17$
Given	Addition Property	Division Property

c. We start with the equation $5x - 28 = 57$. The first step to solve this equation is to add 28 to both sides of the equation, demonstrating the addition property of equality. Next, divide both sides of the equation by 5 using the division property of equality. Therefore, x is 17.

d.

$5x - 28 = 57$	Given
$5x = 85$	Addition Property
$x = 17$	Division Property

2. a. Given: \overline{AC} and \overline{BD} bisect each other at M
 Prove: $\triangle AMB \cong \triangle CMD$

- c.
1. Given
 2. Definition of bisector
 3. Definition of bisector
 4. Definition of vertical angles
 5. Side-angle-side triangle congruence

d.

	$\overline{AM} \cong \overline{MC}$ Definition of bisector	
\overline{AC} and \overline{BC} bisect each other Given	$\overline{BM} \cong \overline{MD}$ Definition of bisector	$\triangle AMB \cong \triangle CMD$ Side-angle-side triangle congruence
	$\angle AMB \cong \angle DMC$ Definition of vertical angles	

3. Answers will vary. Check student reasoning so be sure that it matches selection.