



UNDEFINED TERMS, POSTULATES AND THEOREMS

Proof Order: Which Step Must Come First?

8 boxes · two steps each · a step uses only facts above it

FREE

1

Top	$130 + m\angle 6 = 180$	Substitution
Bottom	$m\angle 6 = 50$	Subtraction Property of Equality

- The bottom step comes first. **Go to box 2.**
- The top step comes first. **Go to box 8.**

Hint: Ask which step could still be written if the other one were missing.

2

Top	$m\angle 3 = 59$	Subtraction Property of Equality
Bottom	$m\angle 1 = 59$	Substitution

- The top step comes first. **Go to box 7.**
- The bottom step comes first. **Go to box 6.**

Hint: A step can use only facts that are written above it.

3

Top	$130 + m\angle 6 = 180$	Substitution
Bottom	$m\angle 5 + m\angle 6 = 180$	Linear pairs are supplementary

- The bottom step comes first. **Go to box 2.**
- The top step comes first. **Go to box 5.**

Hint: Ask which step could still be written if the other one were missing.

4

Top	$m\angle 7 = m\angle 8$	Definition of congruent angles
Bottom	$m\angle 8 + m\angle 8 = 180$	Substitution

- The top step comes first. **Go to OUT.**
- The bottom step comes first. **Go to box 1.**

Hint: A step can use only facts that are written above it.

1. **Give each student page 3.**
2. **Say this once:** *“Start at box 5. Decide which step must come first. Go where your answer says. Write every box number in the row at the bottom.”*
3. **Let them work.** Nothing else is needed.

Maze page 3, one per student.
Answers page 4 — yours.

A clean run is six boxes and OUT: $5 \rightarrow 2 \rightarrow 7 \rightarrow 1 \rightarrow 8 \rightarrow 4 \rightarrow \text{OUT}$. A longer row means a wrong answer, and the row shows where.

Every wrong answer is the same mistake. The student puts a step above the fact that it uses. Students often do this. The steps come from three short proofs about angle pairs, and every step is correct mathematics.

The names of the reasons do not tell the order. A habit such as “definitions first, Substitution later” gives the wrong answer in several boxes.

Boxes 3 and 6 are not on the route. A student reaches them only by a wrong answer. They look like every other box, with two steps of their own. The right answer there leads back onto the route.



This is the free lesson this activity came from. The worksheet, the full answers and the lesson plan are on it, at three levels of difficulty.
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Maze — which step must come first?

A step uses only facts above it

Name _____

Period _____

Date _____

Start at box 5. Each box shows two steps from one proof, with their reasons. A step can use only facts written above it. Decide which step must come first, and go to the box your answer names. Write every box number in the row at the bottom as you go. Stop when a box sends you OUT.

1 <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 15%;">Top</td> <td style="width: 35%;">$130 + m\angle 6 = 180$</td> <td style="width: 50%;">Substitution</td> </tr> <tr> <td>Bottom</td> <td>$m\angle 6 = 50$</td> <td>Subtraction Property of Equality</td> </tr> </table> - The bottom step comes first. Go to box 2. - The top step comes first. Go to box 8. <i>Hint: Ask which step could still be written if the other one were missing.</i>	Top	$130 + m\angle 6 = 180$	Substitution	Bottom	$m\angle 6 = 50$	Subtraction Property of Equality	2 <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 15%;">Top</td> <td style="width: 35%;">$m\angle 3 = 59$</td> <td style="width: 50%;">Subtraction Property of Equality</td> </tr> <tr> <td>Bottom</td> <td>$m\angle 1 = 59$</td> <td>Substitution</td> </tr> </table> - The top step comes first. Go to box 7. - The bottom step comes first. Go to box 6. <i>Hint: A step can use only facts that are written above it.</i>	Top	$m\angle 3 = 59$	Subtraction Property of Equality	Bottom	$m\angle 1 = 59$	Substitution
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Write each box number here, in order, as you go. Start with 5.

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Maze — answers

For the teacher

5 → 2 → 7 → 1 → 8 → 4 → OUT

Box		Top step	Bottom step	Comes first, and goes to	Wrong answer goes to
1	on the route	$130 + m\angle 6 = 180$ (Substitution)	$m\angle 6 = 50$ (Subtraction Property of Equality)	top → 8	bottom → 2
2	on the route	$m\angle 3 = 59$ (Subtraction Property of Equality)	$m\angle 1 = 59$ (Substitution)	top → 7	bottom → 6
3	off the route	$130 + m\angle 6 = 180$ (Substitution)	$m\angle 5 + m\angle 6 = 180$ (Linear pairs are supplementary)	bottom → 2	top → 5
4	on the route	$m\angle 7 = m\angle 8$ (Definition of congruent angles)	$m\angle 8 + m\angle 8 = 180$ (Substitution)	top → OUT	bottom → 1
5	on the route	$m\angle 3 + 31 = 90$ (Substitution)	$m\angle 3 + m\angle 4 = 90$ (Definition of complementary angles)	bottom → 2	top → 3
6	off the route	$m\angle 7 + m\angle 8 = 180$ (Definition of supplementary angles)	$m\angle 8 + m\angle 8 = 180$ (Substitution)	top → 7	bottom → 2
7	on the route	$\angle 8$ is a right angle (Definition of a right angle)	$m\angle 8 = 90$ (Division Property of Equality)	bottom → 1	top → 3
8	on the route	$m\angle 1 = 59$ (Substitution)	$m\angle 1 = m\angle 3$ (Vertical angles have equal measure)	bottom → 4	top → 6