

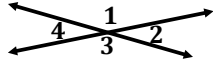
## Two-Column Proofs Part 1

Today, you'll be doing exactly what you did on the Justifying Work pages—explaining how problems were solved and using explanations to solve problems according to instruction. However, you will now be expected to use technical math reasons rather than casual explanations. This is where the translating page you worked on will come in handy. Every explanation has technical vocabulary to describe it. You have to translate and to use that vocabulary.

<b>Problem #1:</b> <b>Given:</b> $\angle 1$ & $\angle 7$ are supplementary angles. $m\angle 1 = (3x + 13)^\circ$ & $m\angle 7 = (6x + 23)^\circ$ <b>Prove:</b> $m\angle 1 = 61^\circ$		<b>Problem #2:</b> <b>Given:</b> $\angle 5$ & $\angle 9$ are complementary angles. $m\angle 5 = (7x + 3)^\circ$ & $m\angle 9 = (4x + 10)^\circ$ <b>Prove:</b> $m\angle 9 = 38^\circ$	
<b>Statements</b>	<b>Reasons</b>	<b>Statements</b>	<b>Reasons</b>
1. $\angle 1$ & $\angle 7$ are supplementary angles. $m\angle 1 = (3x + 13)^\circ$ & $m\angle 7 = 6x + 23^\circ$	1. _____	1. _____	1. Given
2. $m\angle 1 + m\angle 7 = 180$	2. _____	2. _____	2. Definition of Complementary Angles
3. $3x + 13 + 6x + 23 = 180$	3. _____	3. _____	3. Substitution Property of Equality
4. $9x + 36 = 180$	4. _____	4. _____	4. Simplify
5. _____	5. Subtraction Property of Equality.	5. $11x = 77$	5. _____
6. _____	6. Division Property of Equality	6. $x = 7$	6. _____
7. _____	7. Substitution Property of Equality	7. $m\angle 9 = 4(7) + 10$	7. _____
8. _____	8. Simplify	8. $m\angle 9 = 38^\circ$	8. _____

Two-Column Proofs Part 1

**Problem #3:**

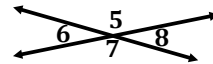


**Given:**  $\angle 1$  &  $\angle 3$  are vertical angles,  $m\angle 1 = (4x + 16)^\circ$  &  $m\angle 3 = (5x - 14)^\circ$

**Prove:**  $m\angle 3 = 136^\circ$

Statements	Reasons
1. $\angle 1$ & $\angle 3$ are vertical angles, $m\angle 1 = (4x + 16)^\circ$ & $m\angle 3 = (5x - 14)^\circ$	1. _____
2. $\angle 1 \cong \angle 3$	2. _____
3. $m\angle 1 = m\angle 3$	3. _____
4. $4x + 16 = 5x - 14$	4. _____
5. $16 = x - 14$	5. _____
6. _____	6. Addition Property of Equality
7. _____	7. Symmetric Property of Equality
8. _____	8. Substitution Property of Equality
9. _____	9. Simplify

**Problem #4:**



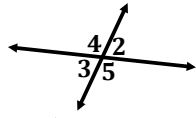
**Given:**  $\angle 6$  &  $\angle 8$  are vertical angles,  $m\angle 6 = (7x + 22)^\circ$  &  $m\angle 8 = (12x + 17)^\circ$

**Prove:**  $m\angle 6 = 29^\circ$

Statements	Reasons
1. _____	1. Given
2. _____	2. Vertical Angles Theorem
3. _____	3. Definition of Congruence
4. _____	4. Substitution Property of Equality
5. _____	5. Subtraction Property of Equality
6. $5 = 5x$	6. _____
7. $1 = x$	7. _____
8. $x = 1$	8. _____
9. $m\angle 6 = 7(1) + 22$	9. _____
10. $m\angle 6 = 29^\circ$	10. _____

Two-Column Proofs Part 1

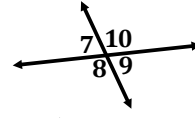
**Problem #5:**



**Given:**  $m\angle 3 = (9x + 16)^\circ$  &  $m\angle 5 = (11x + 24)^\circ$   
**Prove:**  $m\angle 5 = 101^\circ$

Statements	Reasons
1. $\angle 3$ & $\angle 5$ are a linear pair. $m\angle 3 = (9x + 16)^\circ$ & $m\angle 5 = (11x + 24)^\circ$ .	1. _____
2. $m\angle 3 + m\angle 5 = 180$	2. _____
3. $9x + 16 + 11x + 24 = 180$	3. _____
4. $20x + 40 = 180$	4. _____
5. _____	5. Subtraction Property of Equality
6. _____	6. Division Property of Equality
7. _____	7. Substitution Property of Equality
8. _____	8. Simplify

**Problem #6:**



**Given:**  $m\angle 7 = (8x - 15)^\circ$  &  $m\angle 9 = (7x - 3)^\circ$   
**Prove:**  $m\angle 7 = 81^\circ$

Statements	Reasons
1. _____	1. Given
2. _____	2. Vertical Angles Theorem
3. _____	3. Definition of Congruence
4. _____	4. Substitution Property of Equality
5. $x - 15 = -3$	5. _____
6. $x = 12$	6. _____
7. $m\angle 7 = 8(12) - 15$	7. _____
8. $m\angle 7 = 81^\circ$	8. _____