



- I can write logical arguments using properties from algebra and geometry.

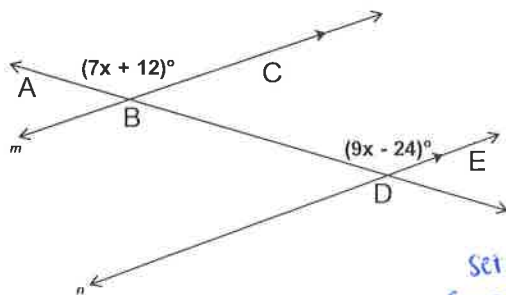
REASON BANK

Addition Property of Equality Alternate Interior Angles Theorem Alternate Interior Angles Converse Alternate Exterior Angles Theorem Alternate Exterior Angles Converse Combine Like Terms Congruent Complements Theorem Congruent Supplements Theorem Consecutive Interior Angles Theorem Consecutive Interior Angles Converse Corresponding Angles Postulate	Corresponding Angles Converse Division Property Distributive Property Given Linear Pair Postulate Multiplication Property Simplification Substitution Property Subtraction Property Transitive Property Vertical Angles Theorem
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1. Please solve for x by completing the two column proof.

Given: $m\angle ABC = (7x + 12)^\circ$, $m\angle BDE = (9x - 24)^\circ$, $m \parallel n$ ← first statement

Prove: $x = 18$ ← last statement



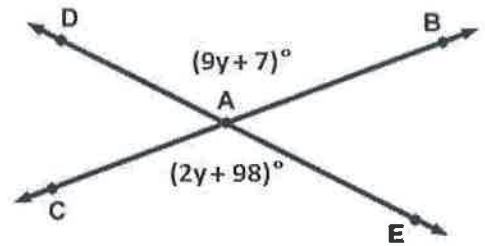
Set up equation from diagram

Statements	Reasons
1) $m\angle ABC = (7x + 12)^\circ$ $m\angle BDE = (9x - 24)^\circ$ $m \parallel n$	1) <u>Given</u>
2) $7x + 12 = 9x - 24$	2) <u>Corresponding angles postulate</u>
3) $12 = 2x - 24$	3) <u>subtraction prop</u>
4) $36 = 2x$	4) <u>addition prop</u>
5) $x = 18$	5) <u>division prop</u>

2. Given the diagram below and $m\angle DAB = (9y+7)^\circ$ and $m\angle CAE = (2y+98)^\circ$, prove that $y = 13$.

Statements Reasons

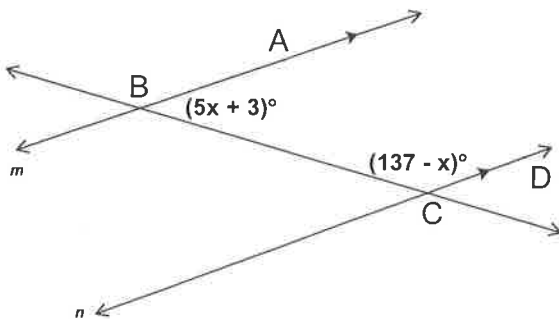
1) $m\angle DAB = (9y+7)^\circ$ $m\angle CAE = (2y+98)^\circ$	1) Given
2) $9y+7 = 2y+98$	2) Vertical Angles Theorem
3) $7y+7 = 98$	3) Subtraction prop
4) $7y = 91$	4) Subtraction prop
5) $y = 13$	5) division prop



3. Please solve for x by completing the two column proof.

Given: $m\angle ABC = (5x+3)^\circ$, $m\angle BCD = (137-x)^\circ$, $m \parallel n$

Prove: $x = 10$



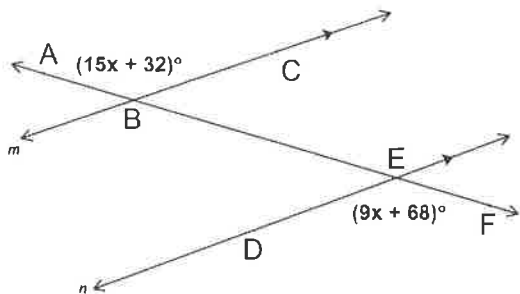
Statements Reasons

1) $m\angle ABC = (5x+3)^\circ$ $m\angle BCD = (137-x)^\circ$ $m \parallel n$	1) Given Consecutive Interior
2) $5x+3+137-x = 180$	2) Angles Theorem
3) $4x+140 = 180$	3) Combine Like Terms
4) $4x = 40$	4) Subtraction Prop
5) $x = 10$	5) Division Prop

4. Please find $m\angle ABC$ by completing the two column proof.

Given: $m\angle ABC = (15x + 32)^\circ$, $m\angle DEF = (9x + 68)^\circ$, $m \parallel n$

Prove: $m\angle ABC = 122^\circ$

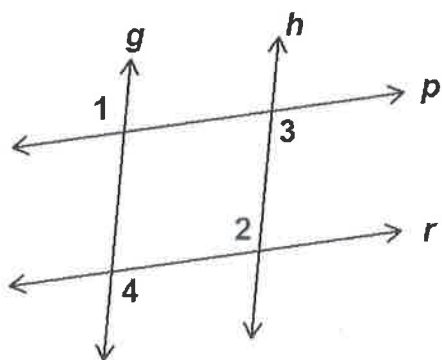


Statements	Reasons
1) $m\angle ABC = (15x + 32)^\circ$ $m\angle DEF = (9x + 68)^\circ$ $m \parallel n$	1) <u>given</u>
2) $15x + 32 = 9x + 68$	2) <u>Alt. Ext. Angles Theorem</u>
3) $6x + 32 = 68$	3) <u>Subtraction prop</u>
4) $6x = 36$	4) <u>Subtraction prop</u>
5) $x = 6$	5) <u>Division prop</u>
6) $m\angle ABC = 15(6) + 32$	6) <u>substitution prop</u>
7) $m\angle ABC = 122^\circ$	7) <u>Simplification</u>

5. Given: $\angle 1 \cong \angle 3$

Prove: $\angle 2 \cong \angle 4$

parallel lines?



Statements	Reasons
1) $\angle 1 \cong \angle 3$	1) <u>Given</u>
2) $g \parallel h$	2) <u>Alternate Exterior Angles <u>converse</u></u>
3) $\angle 2 \cong \angle 4$	3) <u>Alternate Interior Angles Theorem</u>