

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

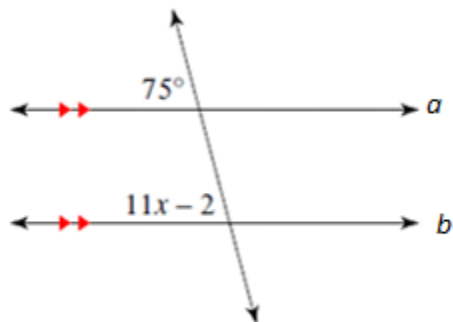
Substitution Property

Subtraction Property

Transitive Property

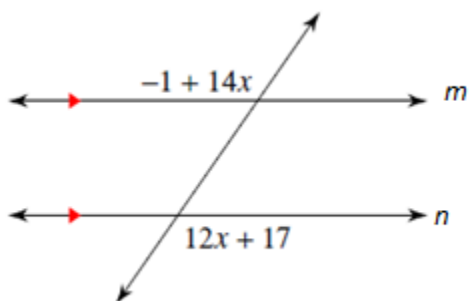
Vertical Angles Theorem

- 1) Given $a \parallel b$ and angle measures marked, please prove that $x = 7$.



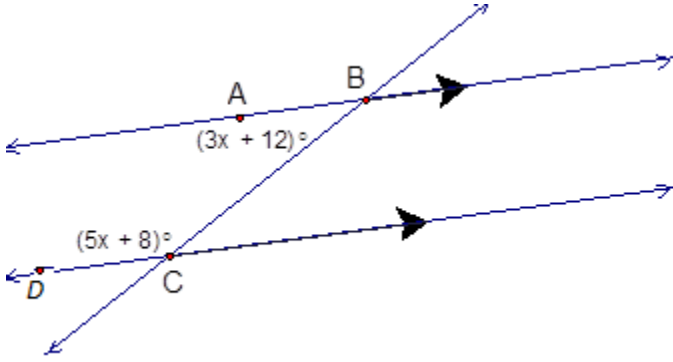
Statements	Reasons
1. $a \parallel b$ and diagram w/values	1. Given
2.	2.
3.	3.
4.	4.

- 2) Given $m \parallel n$ and angle measures marked, please prove that $x = 9$.



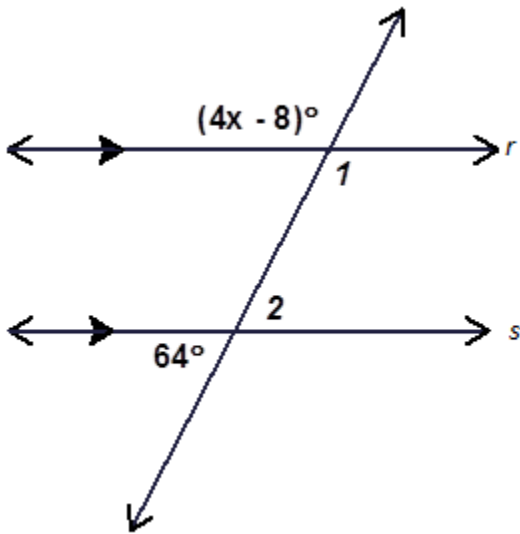
Statements	Reasons
1. $m \parallel n$ and diagram w/values	1. Given
2.	2.
3.	3.
4.	4.
5.	5.

3) Given $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, $m\angle ABC = (3x + 12)^\circ$, and $m\angle BCD = (5x + 8)^\circ$, please prove that the $m\angle ABC = 72^\circ$.



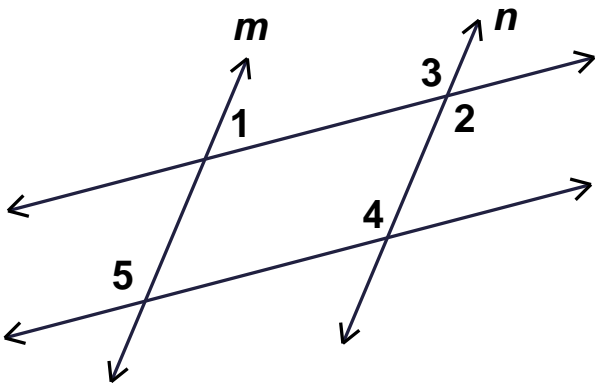
Statements	Reasons
1. $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, $m\angle ABC = (3x + 12)^\circ$, and $m\angle BCD = (5x + 8)^\circ$	1. Given
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

4) Given $r \parallel s$ and angles marked in the diagram, please prove $x = 31$.



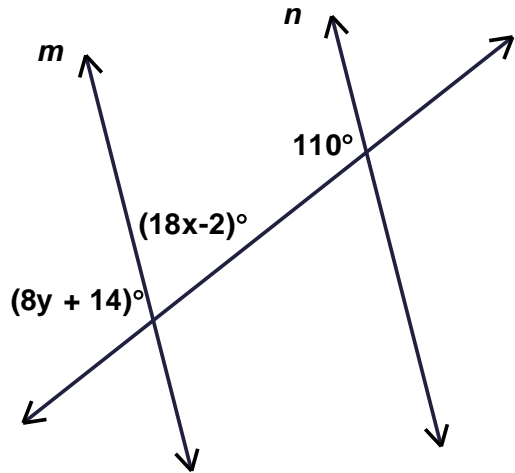
Statements	Reasons
1. $r \parallel s$ and diagram w/values	1. Given
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

5) Given $\angle 1$ and $\angle 2$ are supplementary, please prove $\angle 4 \cong \angle 5$.



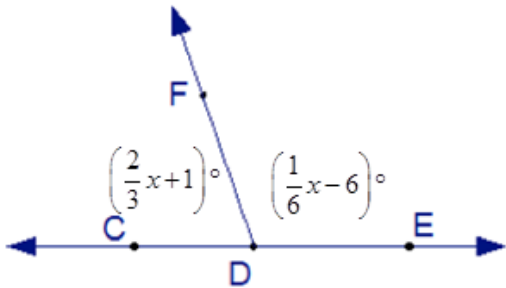
Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

6) Given that $m \parallel n$, please solve for x and y .



Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.

7) Given the diagram below, $m\angle FDC = \left(\frac{2}{3}x + 1\right)^\circ$ and $m\angle FDE = \left(\frac{1}{6}x - 6\right)^\circ$, prove that $m\angle FDE = 31^\circ$.



Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

Answer Key

1.

Statements	Reasons
1. $a \parallel b$ and diagram w/values	1. Given
2. $11x - 2 = 75$	2. Corr. \angle Postulate
3. $11x = 77$	3. Addition Prop.
4. $x = 7$	4. Division Prop.

2.

Statements	Reasons
1. $m \parallel n$ and diagram w/values	1. Given
2. $-1 + 14x = 12x + 17$	2. Alt. Ext. \angle Thm
3. $-1 + 2x = 17$	3. Subtraction Prop.
4. $2x = 18$	4. Addition Prop.
5. $x = 9$	5. Division Prop.

3.

Statements	Reasons
1. $\overrightarrow{AB} \parallel \overrightarrow{CD}$, $m\angle ABC = (3x + 12)^\circ$, and $m\angle BCD = (5x + 8)^\circ$	1. Given
2. $3x + 12 + 5x + 8 = 180$	2. Cons. Int \angle Thm
3. $8x + 20 = 180$	3. Combine Like Terms
4. $8x = 160$	4. Subtraction Prop.
5. $x = 20$	5. Division Prop.
6. $m\angle ABC = 3(20) + 12$	6. Substitution Prop.
7. $m\angle ABC = 72^\circ$	7. Simplification

4.

Statements	Reasons
1. $r \parallel s$ and diagram w/values	1. Given
2. $m\angle 1 = 4x - 8$	2. VAT
3. $m\angle 2 = 64$	3. VAT
4. $4x - 8 + 64 = 180$	4. Cons. Int \angle Thm
5. $4x + 56 = 180$	5. Simplification
6. $4x = 124$	6. Subtraction Prop.
7. $x = 31$	7. Division Prop.

5.

Statements	Reasons
1. $\angle 1$ and $\angle 2$ are Supplementary	1. Given
2. $\angle 2 \cong \angle 3$	2. VAT
3. $\angle 1$ and $\angle 3$ are Supplementary	3. Substitution Property
4. $m \parallel n$	4. Cons Int \angle Converse
5. $\angle 4 \cong \angle 5$	5. Corresponding Angles Postulate

6.

Statements	Reasons
1. $m \parallel n$	1. Given
2. $8y + 14 = 110$	2. Corr \angle Postulate
3. $8y = 96$	3. Subtraction Property
4. $y = 12$	4. Division Property
5. $18x - 2 + 110 = 180$	5. Cons Int \angle Theorem
6. $18x + 108 = 180$	6. Combine Like Terms
7. $18x = 72$	7. Subtraction Property
8. $x = 4$	8. Division Property

7.

Statements	Reasons
1. $m\angle FDC = \left(\frac{2}{3}x + 1\right)^\circ, m\angle FDE = \left(\frac{1}{6}x - 6\right)^\circ$	1. Given
2. $\left(\frac{2}{3}x + 1\right)^\circ + \left(\frac{1}{6}x - 6\right)^\circ = 180^\circ$	2. Linear Pair Postulate
3. $\frac{5}{6}x - 5 = 180$	3. Combine Like Terms
4. $\frac{5}{6}x = 185$	4. Addition Property
5. $x = 222$	5. Multiplication Property
6. $m\angle FDE = \left(\frac{1}{6}(222) - 6\right)^\circ$	6. Substitution Property
7. $m\angle FDE = 31^\circ$	7. Simplification