

1. Write the converse of each statement and then circle True or False.
 a. If two angles of a triangle are congruent, then the sides opposite those angles are congruent.

If the sides opp 2 angles in a Δ are \cong , then the angles are \cong

TRUE FALSE

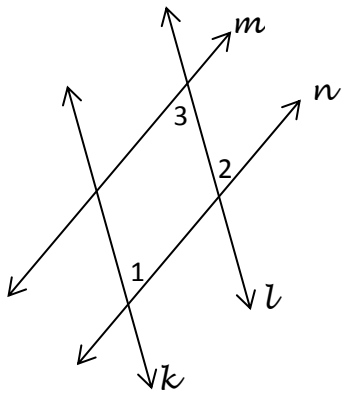
- b. If two angles are right angles, then they are congruent.

If 2 \angle 's are \cong , then they are right \angle 's

TRUE FALSE

2. Given: line $k \parallel$ line l ; $m\angle 1 = 16x + 11$, $m\angle 2 = 24x - 21$,
 $m\angle 3 = 102 - 8x$.

Using this information, is line $m \parallel$ line n ?



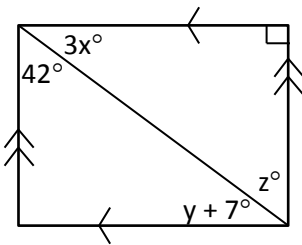
$$16x + 11 = 24x - 21 \text{ (} \parallel \text{ lines} \rightarrow \text{corr } \angle \text{'s } \cong \text{)}$$

$$32 = 8x$$

$$x = 4$$

No, $\angle 2$ would need to equal $\angle 3$ so alt int \angle 's would be \cong , but they aren't equal.

3. Solve for x , y , and z .



$$z = 42^\circ \text{ (} \parallel \text{ lines} \rightarrow \text{alt int } \angle \text{'s } \cong \text{)}$$

$$42 + 90 + 3x = 180 \text{ (} \Delta \text{ sum is } 180^\circ \text{)}$$

$$132 + 3x = 180$$

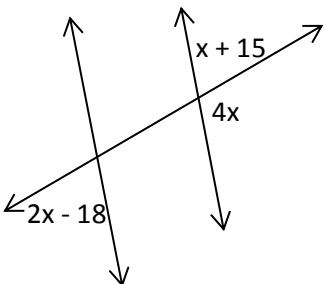
$$3x = 48$$

$$x = 16^\circ$$

$$48 = y + 7 \text{ (} \parallel \text{ lines} \rightarrow \text{alt int } \angle \text{'s } \cong \text{)}$$

$$y = 41^\circ$$

5. Are the lines parallel? Show mathematical evidence to support your response.



$$x + 15 + 4x = 180$$

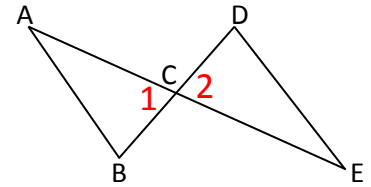
$$5x = 165$$

$$x = 33$$

yes

6. **Given:** C is the midpoint of \overline{AE} ; \overline{AE} bisects \overline{DB}

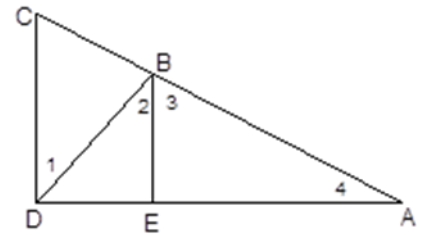
Prove: $\overline{AB} \parallel \overline{DE}$



Statements	Reasons
1. C is the midpoint of \overline{AE}	1. Given
2. $\overline{AC} \cong \overline{EC}$	2. Def of midpoint
3. \overline{AE} bisects \overline{DB}	3. Given
4. $\overline{BC} \cong \overline{DC}$	4. Def of seg bisector
5. $\angle 1 \cong \angle 2$	5. Vert \angle 's thm
6. $\triangle ACB \cong \triangle ECD$	6. SAS
7. $\angle A \cong \angle E$ or $\angle B \cong \angle D$	7. CPCTC
8. $\overline{AB} \parallel \overline{DE}$	8. alt int \angle 's \rightarrow lines

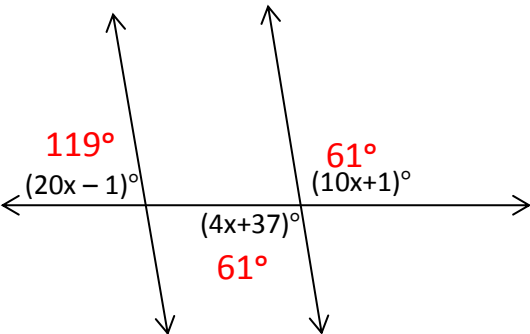
7. **Given:** $\overline{CD} \parallel \overline{BE}$; $\angle 1 \cong \angle 3$

Prove: \overline{BE} bisects $\angle ABD$



Statements	Reasons
1. $\overline{CD} \parallel \overline{BE}$	1. Given
2. $\angle 1 \cong \angle 2$	2. lines \rightarrow alt int \angle 's \cong
3. $\angle 1 \cong \angle 3$	3. Given
4. $\angle 2 \cong \angle 3$	4. Transitive prop (2,3)
5. \overline{BE} bisects $\angle ABD$	5. Def of \angle bisector

5. Are the lines parallel? Show mathematical evidence to support your response.



$$10x + 1 = 4x + 37 \text{ (vert } \angle \text{'s thm)}$$

$$6x = 36$$

$$x = 6$$

yes