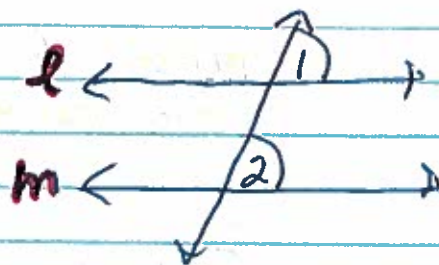


3-2 Proving Lines are Parallel

Converse of Corresponding \angle 's Postulate:
 If 2 lines and a transversal form corresponding \angle 's \cong , then the lines are parallel.

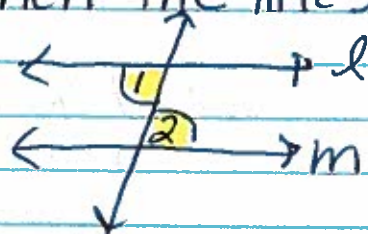
If $\angle 1 \cong \angle 2$
 then line $l \parallel$ line m



Converse of Alternate Interior \angle 's Thm

If 2 lines and a transversal form alt. interior \angle 's \cong , then the lines are \parallel .

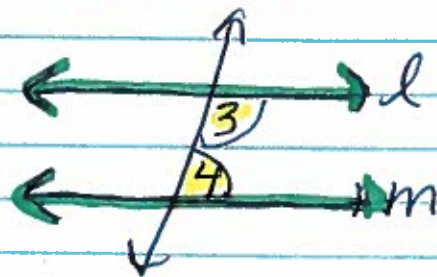
If $\angle 1 \cong \angle 2$,
 then $l \parallel m$



Converse of Same-Side Int. \angle Theorem

If 2 lines and a transversal form same-side interior \angle 's that are supplementary, then the lines are \parallel .

If $\angle 3 + \angle 4 = 180^\circ$
 then $l \parallel m$

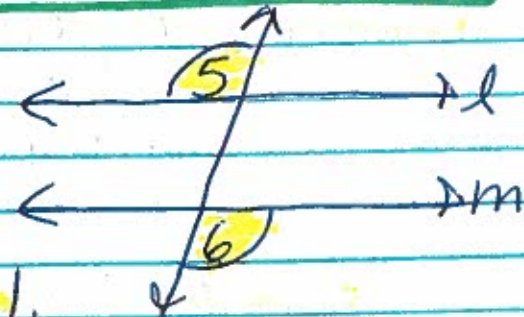


Use Converses to Prove Lines are \parallel

Converse of the Alternate Exterior \angle Thm

If alt. ext. \angle 's \cong ,
If $\angle 5 \cong \angle 6$

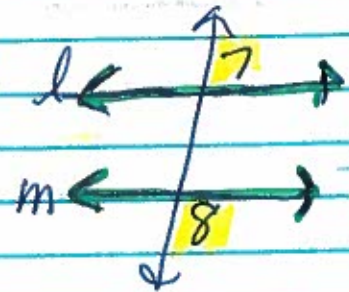
then $l \parallel m$
the lines are parallel.



Converse of Same-Side Exterior \angle Thm

If same-side
ext. \angle 's are supplementary
the lines are parallel

$m\angle 7 + m\angle 8 = 180^\circ$
then $l \parallel m$.

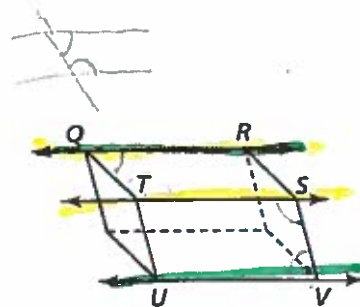


1. **Developing Proof** Complete the paragraph proof for the figure shown.

Given: $\angle RQT$ and $\angle QTS$ are supplementary.
 $\angle TSV$ and $\angle SVU$ are supplementary.

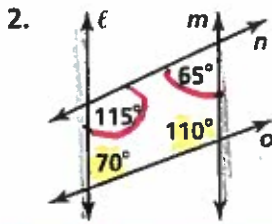
Prove: $\overrightarrow{QR} \parallel \overrightarrow{UV}$

Proof Because $\angle RQT$ and $\angle QTS$ are supplementary, $\angle RQT$ and $\angle QTS$ are a. $\underline{\quad ? \quad}$ angles. By the Same-Side Interior Angles Theorem, b. $\underline{\quad ? \quad} \parallel$ c. $\underline{\quad ? \quad}$. Because $\angle TSV$ and $\angle SVU$ are supplementary, $\angle TSV$ and $\angle SVU$ are d. $\underline{\quad ? \quad}$ angles. By the e. $\underline{\quad ? \quad}$ Theorem, $\overrightarrow{TS} \parallel \overrightarrow{UV}$. Because \overrightarrow{QR} and \overrightarrow{UV} both are parallel to f. $\underline{\quad ? \quad}$, $\overrightarrow{QR} \parallel \overrightarrow{UV}$ by Theorem g. $\underline{\quad ? \quad}$.



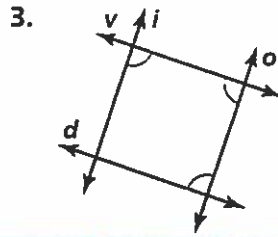
- a. same-side interior
- b. $\overrightarrow{QR} \parallel$ c. \overrightarrow{TS} d. same-side interior
- e. Converse of Same-Side Int. Thm
- f. \overrightarrow{TS} g. Transitive

Which lines or segments are parallel? Justify your answer with a theorem or postulate.

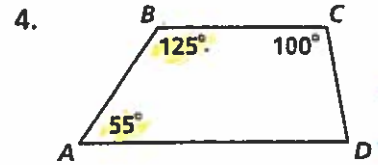


Since $115^\circ + 65^\circ = 180^\circ$
 $70^\circ + 110^\circ = 180^\circ$

Line $l \parallel m$ by converse same side interior \angle Thm.

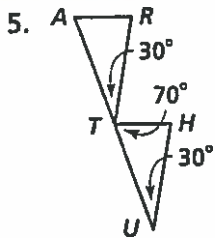


none

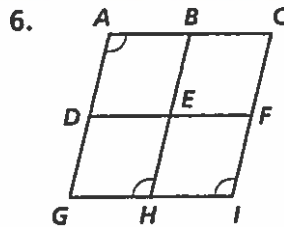


$\angle A + \angle B = 180^\circ$

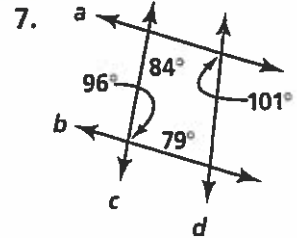
$\overline{BC} \parallel \overline{AD}$ by converse same side int. \angle



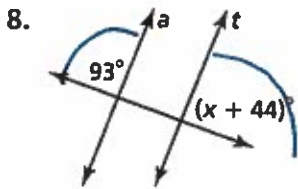
$\overline{RT} \parallel \overline{HU}$
 converse corresponding \angle 's postulate



$\overline{BH} \parallel \overline{CI}$
 converse corresponding \angle 's postulate

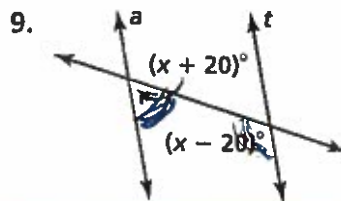


Algebra Find the value of x for which $a \parallel t$.



$$\begin{aligned} x + 44 + 93 &= 180 \\ x + 137 &= 180 \\ -137 \quad -137 & \end{aligned}$$

$x = 43$

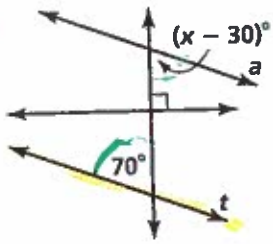


$$x + 20 + x - 20 = 180$$

$$\frac{2x}{2} = \frac{180}{2}$$

$x = 90$

11.



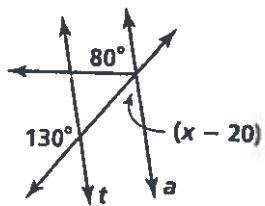
alt. int. \angle 's

$$x - 30 = 70$$

$$+30 \quad +30$$

$$x = 100$$

12.



13.

