Lesson 3 - 2

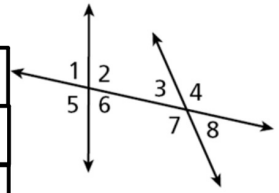
Angles Formed by Parallel Lines and Transversals

Going Deeper

Essential question: *How can you prove and use theorems about angles formed by transversals that intersect parallel lines?*

Warm Up

Identify each angle pair.



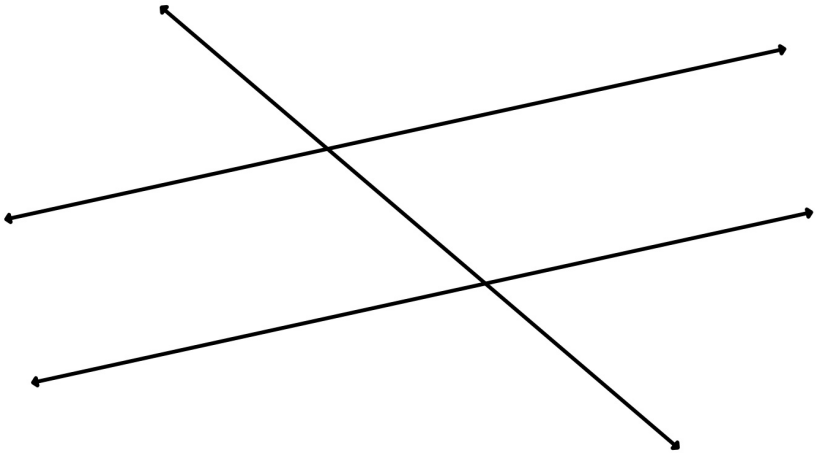
1. ∠1 and ∠3 _____

2. ∠3 and ∠6 _____

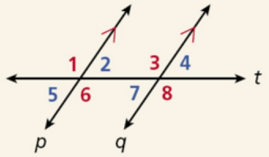
3. ∠4 and ∠5 _____

4. ∠6 and ∠7 _____

What happens if parallel lines are cut by a transversal?

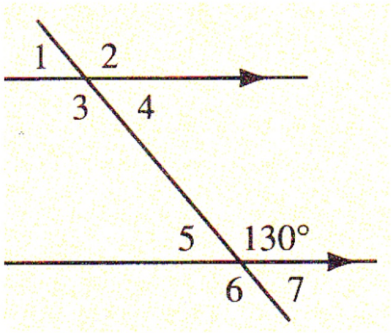


Postulate 3-2-1 _____ **Angles Postulate**

THEOREM	HYPOTHESIS	CONCLUSION
If two parallel lines are cut by a transversal, then the pairs of corresponding angles are _____		∠1 ≅ ∠3 ∠2 ≅ ∠4 ∠5 ≅ ∠7 ∠6 ≅ ∠8

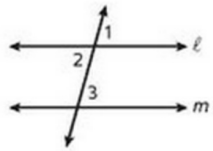
What other angles are also 130 degrees?

How can we find the measure of the other angles?



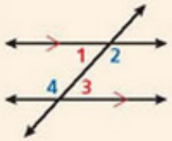
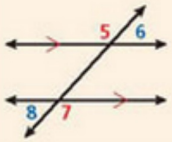
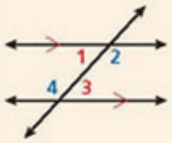
Given: $\ell \parallel m$

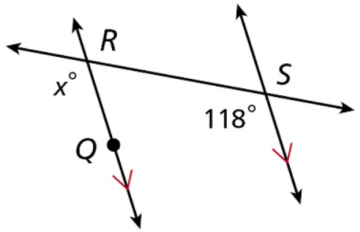
Prove: $\angle 2 \cong \angle 3$



Statements	Reasons
1. $\ell \parallel m$	1. _____
2. $\angle 1 \cong \angle 3$	2. _____
3. $\angle 1 \cong \angle 2$	3. _____
4. $\angle 2 \cong \angle 3$	4. _____

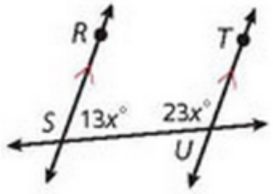
Theorems — Parallel Lines and Angle Pairs

THEOREM	HYPOTHESIS	CONCLUSION
[ ] **Angles Theorem** If two parallel lines are cut by a transversal, then the pairs of alternate interior angles are [ ]		$\angle 1 \cong \angle 3$ $\angle 2 \cong \angle 4$
[ ] **Angles Theorem** If two parallel lines are cut by a transversal, then the two pairs of alternate exterior angles are [ ]		$\angle 5 \cong \angle 7$ $\angle 6 \cong \angle 8$
[ ] **Angles Theorem** If two parallel lines are cut by a transversal, then the two pairs of same-side interior angles are [ ]		$m\angle 1 + m\angle 4 = 180°$ $m\angle 2 + m\angle 3 = 180°$



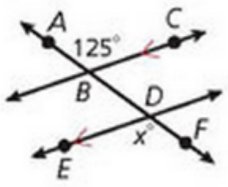
x = [ ]

[ ]



x = [ ]

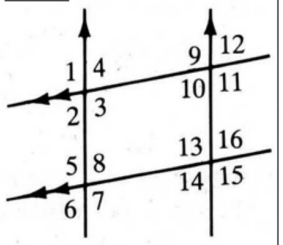
[ ]



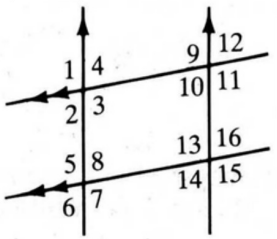
x = [ ]

[ ]

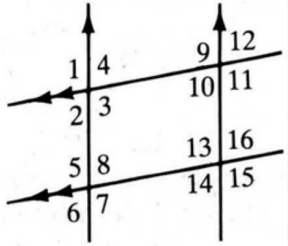
1) If $m(\angle 2)=80$, then
$m(\angle 6)=$_____ and
$m(\angle 7)=$_____



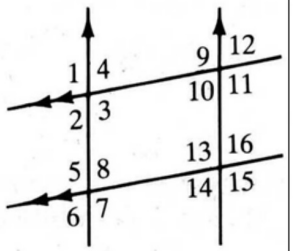
2) If $m(\angle 9)=105$, then
$m(\angle 10)=$_____ and
$m(\angle 16)=$_____



3) If $m(\angle 8)=85$, then
$m(\angle 16)=$_____ and
$m(\angle 10)=$_____

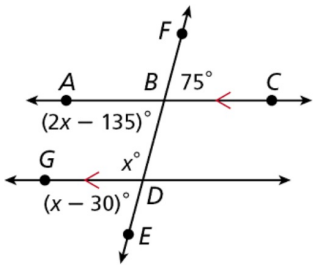


4) If $m(\angle 15)=95$, then
$m(\angle 8)=$_____ and
$m(\angle 1)=$_____



Example 2: Finding Angle Measures

Find each angle measure.



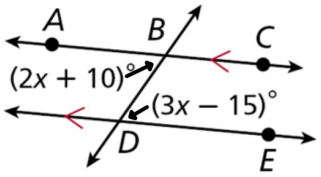
A. m∠*EDG*

m∠*EDG* =

B. m∠BDG

Check It Out! Example 2

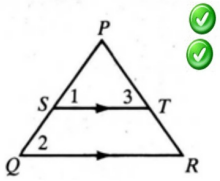
Find m∠ABD.



7)

Given: $\overline{ST} \parallel \overline{QR}$; $\angle 1 \cong \angle 3$

Prove: $\angle 2 \cong \angle 3$

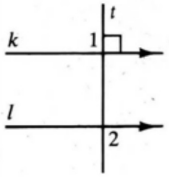


Statements	Reasons
1. _____	1. Given
2. $\angle 1 \cong \angle 2$	2. _____
3. _____	3. _____

8)

Given: $k \parallel l$; $k \perp t$

Prove: $\angle 1 \cong \angle 2$



Statements	Reasons
1. $k \parallel l$; $k \perp t$	1. Given
2. $m\angle 1 = 90$	2. _____
3. $l \perp t$	3. _____
4. $m\angle 2 = 90$	4. _____
5. $m\angle 1 = m\angle 2$, or $\angle 1 \cong \angle 2$	5. _____