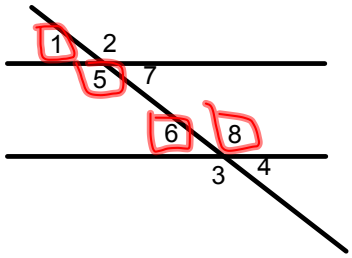
Bell Work

Write all of the following angle pairs

1) Corresponding - 1-6
2) Alternate Interior - 5-8
3) Same-Side Interior - 5-6
4) Vertical Angles
5) Linear Pair



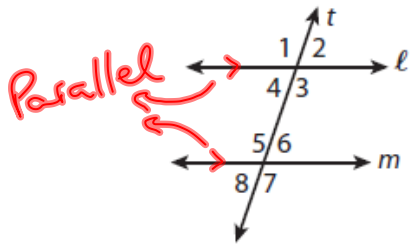
4.3 Proving Lines are Parallel

4.5 Equations of parallel lines

Essential Question: How can you prove that two lines are parallel?

Converse- in an *if-then* statement "if p, then q" you swap p and q

For example: Write the converse to "If it rains, then the ground is wet."



Statements	
lines ℓ and m are parallel	$\angle 4 \cong \angle$ 6, 8
$\angle 6$ and $\angle$ 3, 1 are supplementary	$\angle$ 3, 1 $\cong \angle 7$

Converse of the Same-Side Interior Angles Postulate

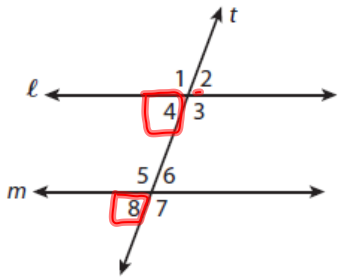
If two lines are cut by a transversal so that a pair of same-side interior angles are supplementary, then the lines are parallel.

Converse of the Alternate Interior Angles Theorem

If two lines are cut by a transversal so that any pair of alternate interior angles are congruent, then the lines are parallel.

Converse of the Corresponding Angles Theorem

If two lines are cut by a transversal so that any pair of corresponding angles are congruent, then the lines are parallel.



Example 3 **Use the given angle relationships to decide whether the lines are parallel. Explain your reasoning.**

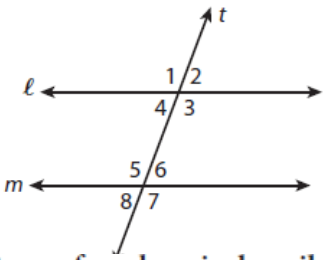
$\angle 3 \cong \angle 5$

$m\angle 4 = (x + 20)°$, $m\angle 8 = (2x + 5)°$, and $x = 15$.

Yes, by Converse of Alt. Int. Ang. Thm.

$\angle 4 = 15 + 20$ $\quad \angle 4 = 35°$

$\angle 8 = 2(15) + 5$ $\quad \angle 8 = 35°$



Identify the type of angle pair described in the given condition. How do you know that lines ℓ and m are parallel?

8. $m\angle 3 + m\angle 6 = 180°$

9. $\angle 2 \cong \angle 6$

How to calculate slope from graph/ordered pairs

Slope formula: $\frac{\Delta y}{\Delta x} \longrightarrow \frac{Y_2 - Y_1}{X_2 - X_1} \longrightarrow \frac{\text{Rise}}{\text{Run}}$

What makes parallel lines never intersect?

① Same Slope

② Different Y-int

$y = mx + b$

m: Slope, b: y-int

Ex. Write the equation of the line parallel to $y = 5x + 1$ that passes through $(-1,2)$.

x, y

$y = mx + b$ $\quad m = 5$

$2 = (5)(-1) + b$

$2 = -5 + b$

$+5 \quad +5$

$7 = b$

$y = 5x + 7$

Ex. 2) Write the equation of the line parallel to $y = -x$, and goes through the point (5, 2.5)

x y

$y = mx + b$

$2.5 = (-1)(5) + b$

$2.5 = -5 + b$

$+5 \quad +5$

$7.5 = b$

$y = -x + 7.5$

Pg. 191-192 #4-10

Pg. 209-210 #5-7, 12, 15