

4-8-19

Aim: SWBAT identify the relationships of angles formed by two parallel lines and a transversal.

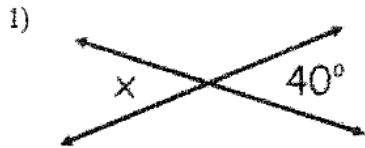
HW: Packet Pages 7 - 8

Quiz Friday

Do Now: Turn in Take Home Test

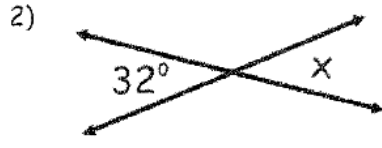
Homework - Complementary, Supplementary & Vertical Angles

State the angle relationship. Find the value of x in each figure.



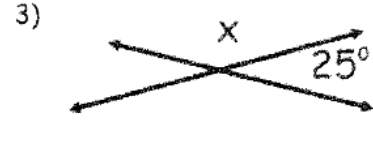
Angle Relationship: vertical

$x = 40^\circ$



Angle Relationship: vertical

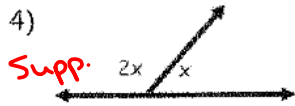
$x = 32^\circ$



Angle Relationship: Supplementary

$x = 155^\circ$

Decide if each pair of angles is either **COMPLEMENTARY** or **SUPPLEMENTARY**. Find the degree measure of each angle. **SHOW ALL WORK ALGEBRAICALLY!**

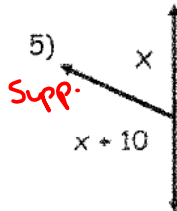


$$2x + x = 180$$

$$\frac{3x}{3} = \frac{180}{3}$$

$$x = 60$$

$$2x = 120$$



$$x + x + 10 = 180$$

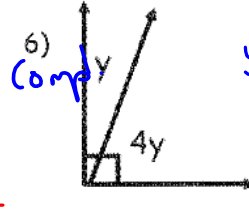
$$2x + 10 = 180$$

$$-10 \quad -10$$

$$\frac{2x}{2} = \frac{170}{2}$$

$$x = 85$$

$$x + 10 = 95$$

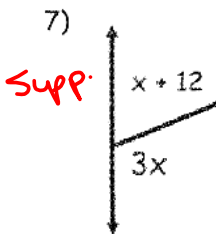


$$y + 4y = 90$$

$$\frac{5y}{5} = \frac{90}{5}$$

$$y = 18$$

$$4y = 72$$



$$x + 12 + 3x = 180$$

$$4x + 12 = 180$$

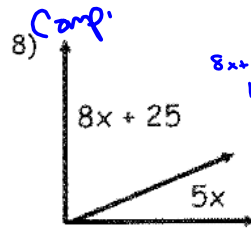
$$-12 \quad -12$$

$$\frac{4x}{4} = \frac{168}{4}$$

$$x = 42$$

$$x + 12 = 54$$

$$3x = 126$$



$$8x + 25 + 5x = 90$$

$$13x + 25 = 90$$

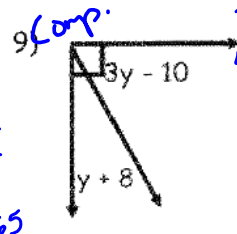
$$-25 \quad -25$$

$$\frac{13x}{13} = \frac{65}{13}$$

$$x = 5$$

$$8x + 25 = 65$$

$$5x = 25$$



$$3y - 10 + y + 8 = 90$$

$$4y - 2 = 90$$

$$+2 \quad +2$$

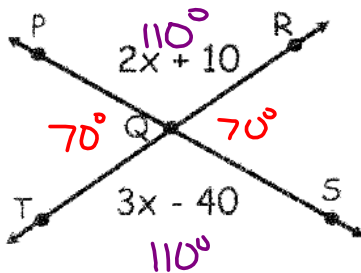
$$\frac{4y}{4} = \frac{92}{4}$$

$$y = 23$$

$$y + 8 = 31$$

$$3y - 10 = 59$$

10) Find the measures of $\angle PQR$, $\angle RQS$, $\angle SQT$, & $\angle TQP$



$$2x + 10 = 3x - 40$$

$$-2x \quad -2x$$

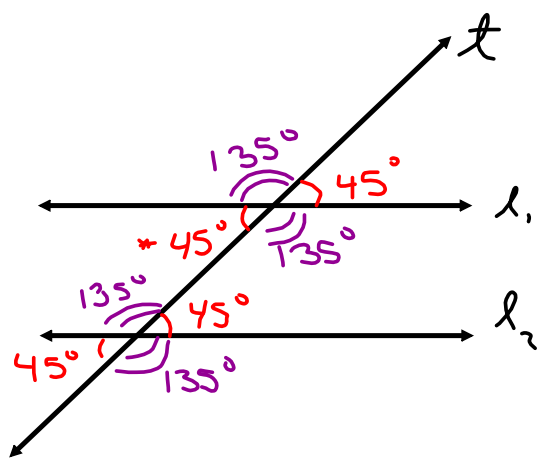
$$\frac{10}{+40} = \frac{x - 40}{+40}$$

$$50 = x$$

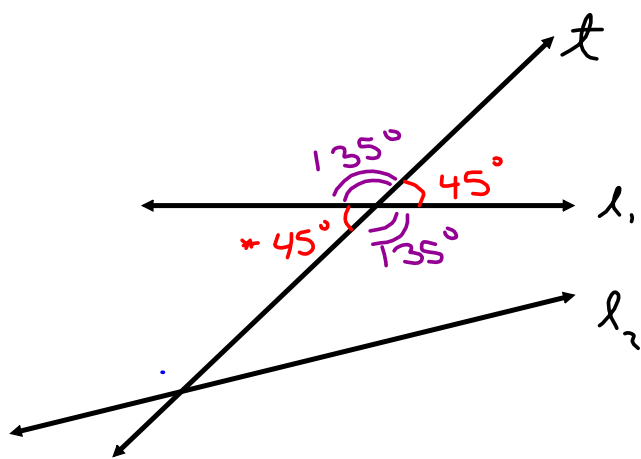
$$2x + 10 = 110^\circ$$

$$3x - 40 = 110^\circ$$

$m\angle PQR = 110^\circ$

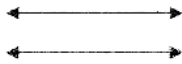


$l_1 \parallel l_2$



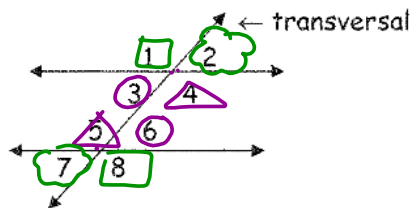
AIM: SWBAT identify the relationships of angles formed by two parallel lines and a transversal. (corresponding angles, alternate interior angles, alternate exterior angles, vertical angles, supplementary angles)

Parallel Lines - lines in the same plane that DO NOT intersect



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Transversal - a line that intersects two lines to form eight angles



Interior Angles: $\angle 3, \angle 4, \angle 5, \angle 6$
(inside parallel lines)

Exterior Angles: $\angle 1, \angle 2, \angle 7, \angle 8$
(outside parallel lines)

* **Alternate Interior Angles** - Interior angles found on opposite sides of the transversal.

When two parallel lines are cut by a transversal the alternate interior angles are congruent.

Examples: $\angle 3$ & $\angle 6, \angle 4$ & $\angle 5$

when 2 || lines are cut by a trans.,
all int. \angle s are \cong .

Alternate Exterior Angles - Exterior angles found on opposite sides of the transversal.

* When two parallel lines are cut by a transversal the alternate exterior angles are congruent.

Examples: $\angle 1$ & $\angle 8, \angle 2$ & $\angle 7$

* **Corresponding Angles** - angles that hold the same position on two different lines cut by the transversal.

When two parallel lines are cut by a transversal the corresponding angles are congruent. Examples: $\angle 1$ & $\angle 5, \angle 2$ & $\angle 6, \angle 3$ & $\angle 7, \angle 4$ & $\angle 8$

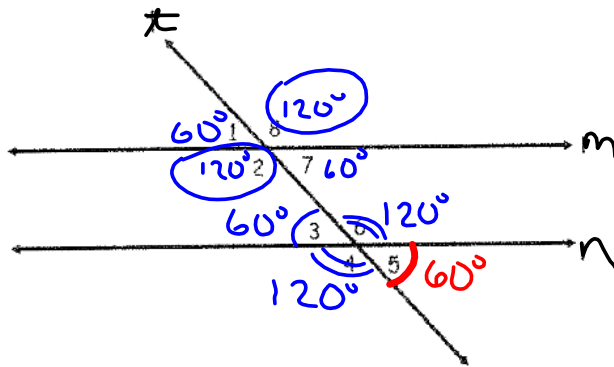
Vertical Angles - angles formed by the intersection of two lines. They are opposite each other and have congruent angle measurements. Vertical angles are ALWAYS congruent.

* Examples: $\angle 1$ & $\angle 4, \angle 2$ & $\angle 3, \angle 5$ & $\angle 8, \angle 6$ & $\angle 7$

* **Supplementary Angles** - two angles whose sum is 180° . Supplementary angles form straight lines.

Examples: $\angle 1$ & $\angle 2, \angle 3$ & $\angle 4, \angle 5$ & $\angle 6, \angle 7$ & $\angle 8, \angle 3$ & $\angle 1, \angle 4$ & $\angle 2, \angle 7$ & $\angle 5, \angle 8$ & $\angle 6$

Angle Relationships



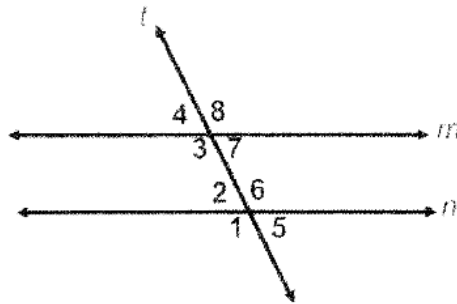
Given:
 $m \parallel n$
 t is a transversal
 $m \angle 5 = 60^\circ$

Use the information given and shown in the diagram to answer the following questions.
ALWAYS START WITH THE GIVEN INFO!

- 1) $\angle 2$ and $\angle 4$ are corresponding angles.
- 2) $\angle 3$ and $\angle 7$ are alternate interior angles.
- 3) $\angle 5$ and $\angle 1$ are alternate exterior angles.
- 4) $\angle 4$ and $\angle 5$ or $\angle 3$ are supplementary angles.
- 5) $\angle 7$ and $\angle 1$ are vertical angles.
- 6) $\angle 6$ is supplementary to $\angle 3$ and $\angle 5$.
- 7) Find the $m \angle 1$. 60° Why? When 2 || lines are cut by a trans., alt. ext. \angle s are \cong .
- 8) Find the $m \angle 6$. 120° Why? supp.
- 9) Find the $m \angle 4$. 120° Why? supp.
- 10) Find the $m \angle 2$. 120° Why? $\angle 4$ and $\angle 5$ are supp.
 $\angle 4 \cong \angle 2$ when 2 || lines are cut by a trans. corr. \angle s are \cong
- 11) Are \angle 's 1 and 7 congruent? Why or why not? Yes. vertical \angle s are always \cong .
- 12) Because I know $\angle 6$ and $\angle 5$ are supplementary angles, if I know the measure of $\angle 5$, I can find the measure of angle 6.

HOMEWORK - Parallel Lines cut by a Transversal

Use the diagram to answer questions 1 - 9.



Given:
 $m \parallel n$
 t is a transversal
 $m \angle 5 = 52^\circ$

1) Name the 2 pairs of alternate interior angles. _____

2) Name the 4 pairs of corresponding angles.

3) Name the 2 pairs of alternate exterior angles. _____

4) Name the 4 pairs of vertical angles.

5) Name the 8 pairs of supplementary angles.

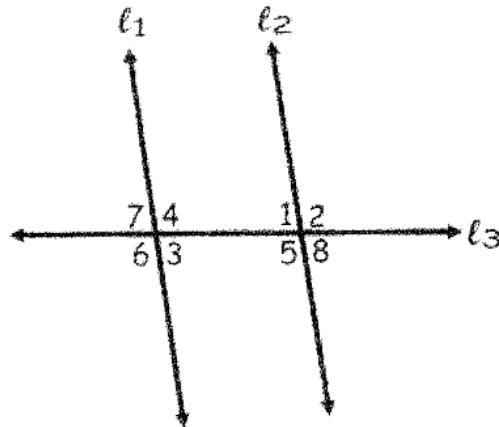
6) Find the $m \angle 2$. _____

7) Find the $m \angle 7$. _____

8) Find the $m \angle 8$. _____

9) Are ALL alternate interior, alternate exterior and corresponding angles congruent?
 Why or Why not?

Use the diagram to answer questions 10 - 16.



<p><u>Given:</u> $l_1 \parallel l_2$ l_3 is a transversal $m\angle 8 = 74^\circ$</p>
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**** Remember when you justify that you can only use the angles whose measures you already know. Label the angles in the diagram as you go to help you.**

10) Find the $m\angle 1$. _____ Justify _____

11) Find the $m\angle 5$. _____ Justify _____

12) Find the $m\angle 3$. _____ Justify _____

13) Find the $m\angle 7$. _____ Justify _____

14) Find the $m\angle 2$. _____ Justify _____

15) Find the $m\angle 4$. _____ Justify _____

16) Find the $m\angle 6$. _____ Justify _____