

## 3.2 - Parallel Lines and Transversals

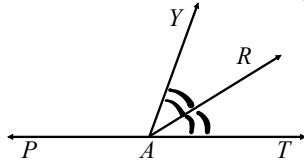
Mental Floss: Fri. Sept 29<sup>th</sup>

Given:  $\overline{AR}$  bisects  $\angle YAT$

$$m\angle YAR = (10x + 6)^\circ$$

$$m\angle RAT = (7x + 13)^\circ$$

Find:  $m\angle PAY$



$$10x + 6 = 7x + 13$$

$$3x = 7$$

$$x = \frac{7}{3}$$

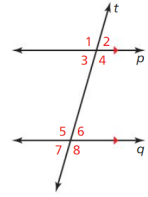
$$m\angle YAR = 10\left(\frac{7}{3}\right) + 6 = 29\frac{1}{3}$$

$$29\frac{1}{3} \cdot 2 = 58\frac{2}{3}$$

$$180 - 58\frac{2}{3} = 121\frac{1}{3}^\circ$$

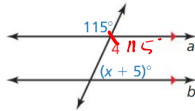
### Angles Formed By Transversals

Name	Examples	Description	Facts
Corresponding Angles	$\angle 1 \& \angle 5$ $\angle 3 \& \angle 7$ $\angle 2 \& \angle 6$ $\angle 4 \& \angle 8$	Same location, different "pod" Same side transversal	If lines $\parallel$ , then angles $\cong$
Alternate Interior Angles	$\angle 3 \& \angle 6$ $\angle 4 \& \angle 5$	Opposite sides of the transversal Both angles between the $\parallel$ lines	If lines $\parallel$ , then angles $\cong$
Alternate Exterior Angles	$\angle 1 \& \angle 8$ $\angle 2 \& \angle 7$	Opposite sides of the transversal Both angles outside the $\parallel$ lines	If lines $\parallel$ , then angles $\cong$
Consecutive Interior Angles	$\angle 3 \& \angle 5$ $\angle 4 \& \angle 6$	Same side of the transversal Both angles between the $\parallel$ lines	If lines $\parallel$ , then angles supp.



#### Example #1 Using Properties of Parallel Lines

Find the value of  $x$ .

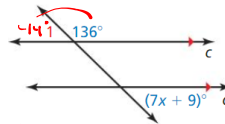


$$x + 5 + 115 = 180$$

$$x = 60$$

#### Example #2 Using Properties of Parallel Lines

Find the value of  $x$ .



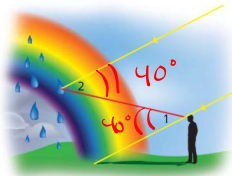
$$7x + 9 = 44$$

$$7x = 35$$

$$x = 5$$

#### Example #3 Solving a Real-life Problem

When sunlight enters a drop of rain, different colors of light leave the drop at different angles. This process is what makes a rainbow. For violet light,  $m\angle 2 = 40^\circ$ . What is  $m\angle 1$ ? How do you know?

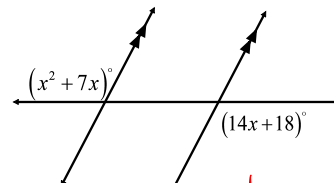


$$m\angle 1 = 40^\circ$$

$$AIA \cong$$

#### Example #4

Find the value(s) of  $x$ .



$$x^2 + 7x = 14x + 18$$

$$x^2 - 7x - 18 = 0$$

$$(x - 9)(x + 2) = 0$$

$$\begin{array}{r} (9)^2 + 7(9) \\ 81 + 63 \\ 144^\circ \end{array}$$

$$\begin{array}{r} (-2)^2 + 7(-2) \\ 4 - 14 \\ -10^\circ \end{array}$$

$$x = 9 - 2$$

$$x = 9$$