Worksheet – *Section 3-2 Angles and Parallel Lines*
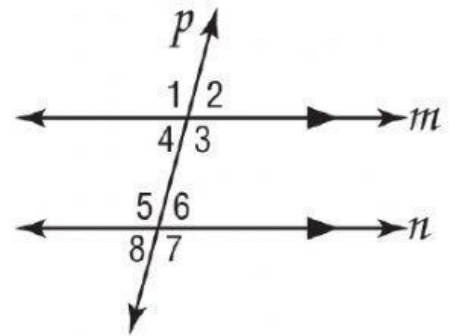
Objectives:
- Understand the **parallel lines cut by a transversal theorem** and **it's converse**
- Find **angle measures** using the Theorem
- Use **algebra to find unknown variable** and angle measures involve **parallel lines and transversals**
- Use **Auxiliary lines** to find unknown angle measures

Parallel Lines and Angle Pairs

When two parallel lines are cut by a transversal, the following pairs of angles are congruent.
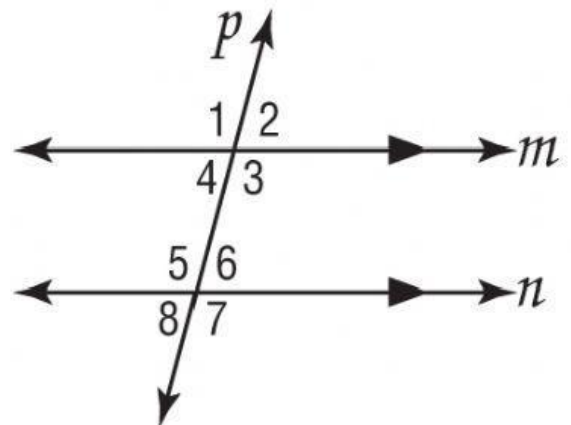
- corresponding angles
- alternate interior angles
- alternate exterior angles

Also, consecutive interior angles are supplementary.

Example:

In the figure, $m\angle 2 = 75$. Find the measures of the remaining angles.

Example:

In the figure, $m\angle 3 = 102$. Find the measure of each angle. Tell which postulate(s) or theorem(s) you used.
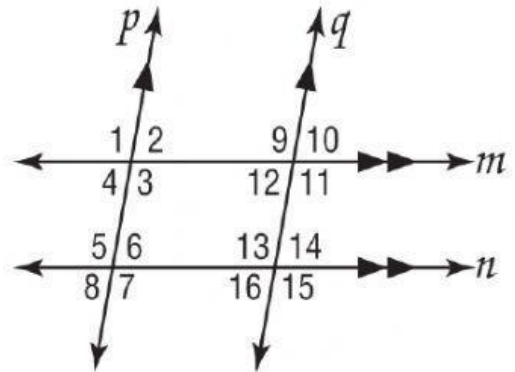
a. $\angle 5$

b. $\angle 6$

c. $\angle 11$

d. $\angle 7$

e. $\angle 15$

f. $\angle 14$

Practice

In the figure, $m\angle 9 = 80$ and $m\angle 5 = 68$. Find the measure of each angle. Tell which postulate(s) or theorem(s) you used.
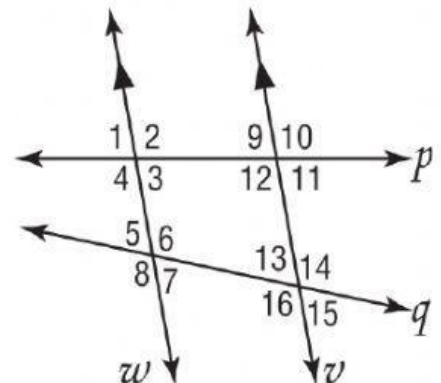
a. $\angle 12$

b. $\angle 1$

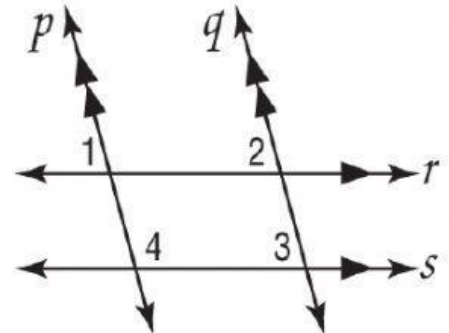c. $\angle 4$

d. $\angle 3$

e. $\angle 7$

f. $\angle 16$

Algebra and Angle Measures

Algebra can be used to find unknown values in angles formed by a transversal and parallel lines.
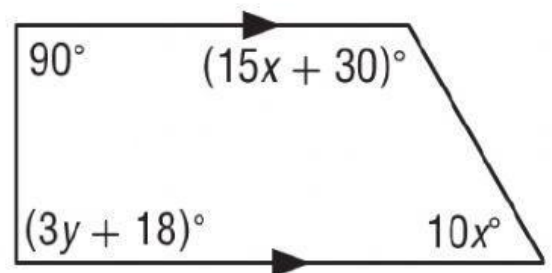

Example:
If $m\angle 1 = 3x + 15$, $m\angle 2 = 4x - 5$, and $m\angle 3 = 5y$, find the value of x and y.
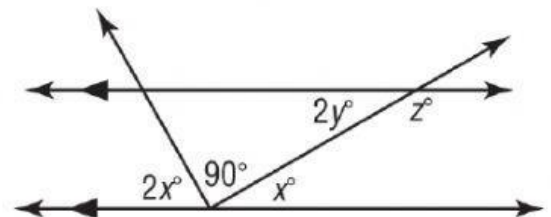

Example:

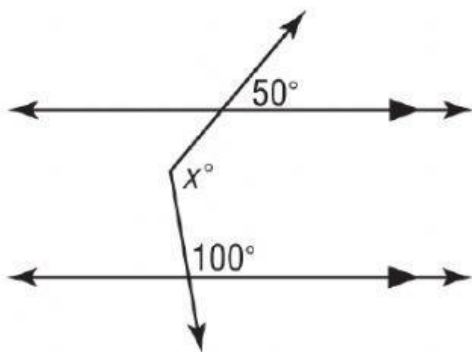Find the value of the variable(s) in each figure. Explain your reasoning.

$90°$ $(15x + 30)°$

$(3y + 18)°$ $10x°$

Example:

Find the value of the variable(s) in each figure. Explain your reasoning.

$2y°$ $z°$

$2x°$ $90°$ $x°$
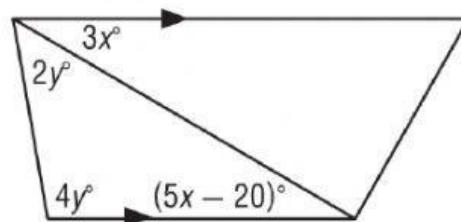
Example(Using a 3rd parallel Line – Auxilury Line)

50°

x°

100°

Practice:
Find the value of the variable(s) in each figure. Explain your reasoning.

3x°

2y°

4y°   (5x − 20)°

Practice:
Find the value of the variable(s) in each figure. Explain your reasoning.

(4z + 6)°

x°

106°

2y°