Mixed Review Exercises

Complete. You may find that drawing a diagram will help you.

1. If M is the midpoint of $\overline{AB}$, then $\_\_?\_\_ \cong \_\_?\_\_$.
2. If $\overrightarrow{BX}$ is the bisector of $\angle ABC$, then $\_\_?\_\_ \cong \_\_?\_\_$.
3. If point B lies in the interior of $\angle AOC$, then $m\angle \_\_?\_\_ + m\angle \_\_?\_\_ = m\angle \_\_?\_\_$.
4. If $\angle POQ$ is a straight angle and R is any point not on $\overleftrightarrow{PQ}$, then $m\angle \_\_?\_\_ + m\angle \_\_?\_\_ = \_\_?\_\_$.

2-2 *Properties from Algebra*

Since the length of a segment is a real number and the measure of an angle is a real number, the facts about real numbers and equality that you learned in algebra can be used in your study of geometry. The properties of equality that will be used most often are listed below.

Properties of Equality

Addition Property	If $a = b$ and $c = d$, then $a + c = b + d$.
Subtraction Property	If $a = b$ and $c = d$, then $a - c = b - d$.
Multiplication Property	If $a = b$, then $ca = cb$.
Division Property	If $a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.
Substitution Property	If $a = b$, then either a or b may be substituted for the other in any equation (or inequality).
Reflexive Property	$a = a$
Symmetric Property	If $a = b$, then $b = a$.
Transitive Property	If $a = b$ and $b = c$, then $a = c$.

Recall that $DE = FG$ and $\overline{DE} \cong \overline{FG}$ can be used interchangeably, as can $m\angle D = m\angle E$ and $\angle D \cong \angle E$. Thus the following properties of congruence follow directly from the related properties of equality.

Properties of Congruence

Reflexive Property	$\overline{DE} \cong \overline{DE}$ $\qquad$ $\angle D \cong \angle D$
Symmetric Property	If $\overline{DE} \cong \overline{FG}$, then $\overline{FG} \cong \overline{DE}$.
	If $\angle D \cong \angle E$, then $\angle E \cong \angle D$.
Transitive Property	If $\overline{DE} \cong \overline{FG}$ and $\overline{FG} \cong \overline{JK}$, then $\overline{DE} \cong \overline{JK}$.
	If $\angle D \cong \angle E$ and $\angle E \cong \angle F$, then $\angle D \cong \angle F$.