

## Mixed Review Exercises

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

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

## 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

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

<b>Reflexive Property</b>	$\overline{DE} \cong \overline{DE}$ $\angle D \cong \angle D$
<b>Symmetric Property</b>	If $\overline{DE} \cong \overline{FG}$ , then $\overline{FG} \cong \overline{DE}$ . If $\angle D \cong \angle E$ , then $\angle E \cong \angle D$ .
<b>Transitive Property</b>	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 $\angle D \cong \angle F$ .