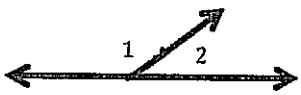
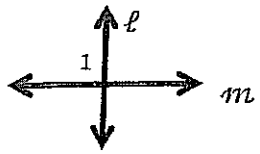
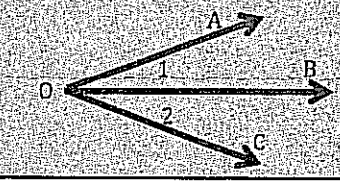
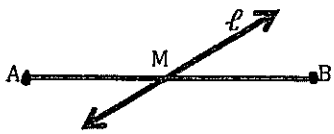
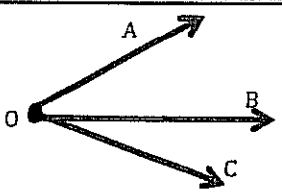
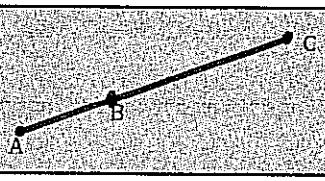
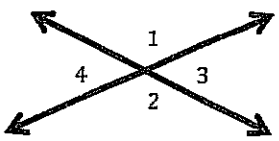
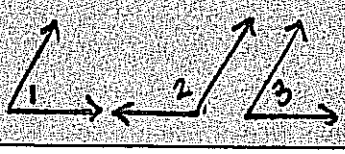
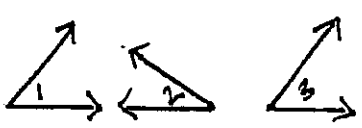
Algebra	Geometry	Algebraic Reason
If $a = b$, then $a + c = b + c$	If $AB = CD$, then $AB + BC = BC + CD$. If $m\angle AOB = m\angle COD$, then $m\angle AOB + m\angle BOC = m\angle BOC + m\angle COD$	+ prop. of =
If $a = b$, then $a - c = b - c$	If $AB = CD$, then $AB - BC = CD - BC$. If $m\angle AOB = m\angle mCOD$, then $m\angle AOB - m\angle BOC = m\angle COD - m\angle BOC$.	- prop. of =
If $a = b$, then $2a = 2b$	If $AB = CD$, then $2(AB) = 2(CD)$.	x prop. of =
If $a = b$, then $\frac{a}{2} = \frac{b}{2}$.	If $AB = CD$, then $\frac{AB}{2} = \frac{CD}{2}$.	÷ prop. of =
$a = a$ $3 = 3$	$AB = AB$; $\overline{AB} \cong \overline{AB}$; $m\angle AOB = m\angle AOB$; $\angle AOB \cong \angle AOB$	Reflexive
If $a = b$, then $b = a$.	If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AB}$. If $m\angle A = m\angle B$, then $m\angle B = m\angle A$.	Symmetric
If $a = b$ and $b = c$, then $a = c$.	If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$. If $m\angle A = m\angle B$ and $m\angle B = m\angle C$, then $m\angle A = m\angle C$.	Transitive
If $a + b = c$ and $b = 2$, then $a + 2 = c$.	If $AB + BC = AC$ and $BC = CD$, then $AB + CD = AC$. If $m\angle A + m\angle B = m\angle C$ and $m\angle B = m\angle D$, then $m\angle A + m\angle D = m\angle C$.	Substitution
$2(x + 6) = 2x + 12$	$2(AB + BC) = 2AB = 2BC$	Distributive

Picture (if needed)	Geometry	Reason
	$\overline{AB} \cong \overline{CD}$ $\quad m\angle 1 = m\angle 2$ $AB = CD$ $\quad \angle 1 \cong \angle 2$	Def. of $\cong$
	$\angle 1$ & $\angle 2$ are a linear pair $\angle 1$ & $\angle 2$ are supplementary	Def. of linear pair
	$\angle 1$ & $\angle 2$ are supplementary $m\angle 1 + m\angle 2 = 180°$	Def. of supp.

	$\ell \perp m$ $\angle 1$ is a right $\angle$	Def. of $\perp$
	$\angle 1$ is a right $\angle$ $m\angle 1 = 90°$	Def. of right $\angle$
	$\angle 1$ & $\angle 2$ are complementary $m\angle 1 + m\angle 2 = 90°$	Def. of comp.
	$\overrightarrow{OB}$ bisects $\angle AOC$ $m\angle 1 = m\angle 2$	Def. of $\angle$ bisector
	ℓ bisects $\overline{AB}$ M is a midpoint of $\overline{AB}$	Def. of segment bisector
	M is a midpoint of $\overline{AB}$ $AM = MB$	Def. of midpoint
	$m\angle AOB + m\angle BOC = m\angle AOC$	Angle addition post.
	$AB + BC = AC$	Segment addition post.
	$\angle 1 \cong \angle 2$ $\angle 3 \cong \angle 4$	Vertical $\angle$s are $\cong$
	$\angle 1$ & $\angle 2$ are supp. $\angle 3$ & $\angle 2$ are supp. $\angle 1 \cong \angle 3$ "angles supp. to same or $\cong$ $\angle s$ are $\cong$ to each other"	Def. supp. $\angle$s
	$\angle 1$ & $\angle 2$ are comp. $\angle 3$ & $\angle 2$ are comp. $\angle 1 \cong \angle 3$ "angles comp. to same or $\cong$ $\angle s$ are $\cong$ to each other"	Def. comp. $\angle$s