Warm Up

Complete the statement, and tell the property that is demonstrated.

1.   If $m\angle 1 = m\angle 3$ then $m\angle 3 =$ _____ $m\angle 1$

                     Symmetric

2.   If $AB = CD$ and $CD = TU$, then _____ $AB = TU$

                     Transitive

3.   If $RS = WX$, then $RS + AB = WX + AB$ Addition Property

2-6   Proof with Segments and Angles

Segment congruence and angle congruence is
reflexive, symmetric, and transitive.

$$AB = AB$$

$$AB = BC \rightarrow BC = AB$$

$$AB = BC \quad BC = XY$$
$$AB = XY$$

Ex 1   Name the property illustrated by each statement.

If $\angle RST \cong \angle MNP$ then $\angle MNP \cong \angle RST$
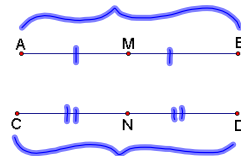
Symmetric Prop.

If $\overline{AB} \cong \overline{FG}$ and $\overline{FG} \cong \overline{MN}$ then $\overline{AB} \cong \overline{MN}$

Transitive Prop.

Ex 2   Write a two column proof

Given: M is the midpoint of $\overline{AB}$
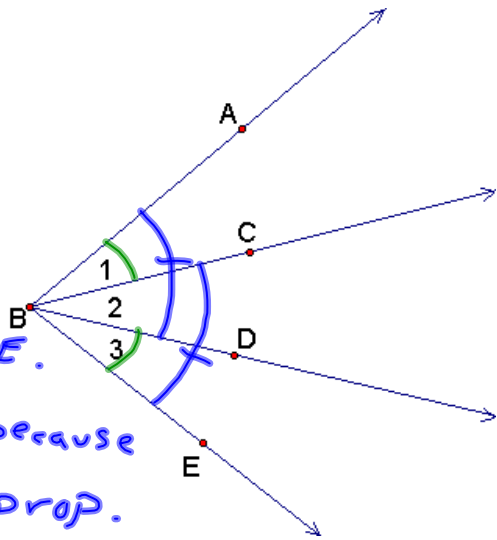N is the midpoint of $\overline{CD}$
$AB = CD$
Prove: $AM = CN$

Statements	Reasons
M is midpt. $\overline{AB}$ N is midpt. $\overline{CD}$ $AB = CD$	Given
$AM = MB$ $CN = ND$	Def. of Midpt.
$AB = AM + MB$ $CD = CN + ND$	Seg. Add. Post.
$AB = AM + AM$ $CD = CN + CN$	Substitution
$AM + AM = CN + CN$	Substitution
$AM = CN$	Division Prop.

Ex 3   Write a paragraph proof.

Given: $m\angle ABD = m\angle CBE$
Prove: $m\angle 1 = m\angle 3$

We know $m\angle ABD = m\angle CBE$.
$m\angle ABD = m\angle 1 + m\angle 2$ because
of the angle addition prop.
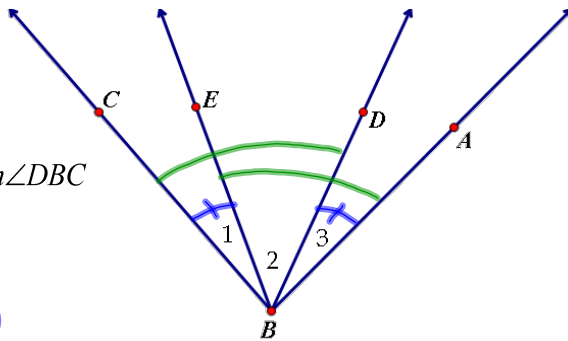Also $m\angle CBE = m\angle 2 + m\angle 3$
Since $m\angle ABD = m\angle CBE$,
$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$ by substitution
Subtracting $m\angle 2$ from both sides
gives $m\angle 1 = m\angle 3$.

Ex 4   Write a flow proof.

Given: $m\angle 1 = m\angle 3$

Prove: $m\angle EBA = m\angle DBC$

$m\angle 1 = m\angle 3$
Given

$m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$
Add. Prop.

$m\angle EBA = m\angle 2 + m\angle 3$
$m\angle DBC = m\angle 1 + m\angle 2$
$\angle$ Add. Post.

$m\angle DBC = m\angle EBA$
Substitution