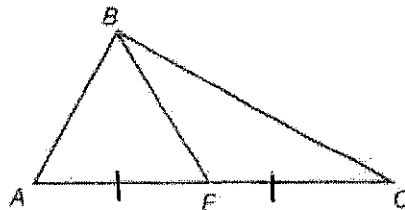


Mini Proofs with Properties & Postulates

Do Now

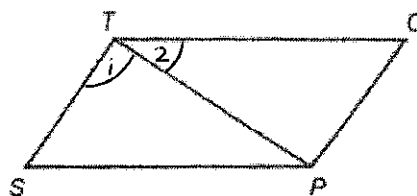
Use the diagram and any information given to mark the diagram with the Given and to draw the appropriate conclusion(s). Be sure to justify each statement with a reason.

1. Given: \overline{BF} bisects \overline{AC} .



Statement	Reason
① \overline{BF} bisects \overline{AC}	① Given
② $\overline{AF} \cong \overline{CF}$	② A segment bisector divides a segment into 2 \cong segments

2. Given: \overline{PT} bisects $\angle STO$.



Statement	Reason
① \overline{PT} bisects $\angle STO$	① Given
② $\angle 1 \cong \angle 2$	② An angle bisector divides an angle into 2 \cong angles

Classwork: Review Properties and Postulates

Write your rules for each of the following properties or postulates. Ex. If $a = b$, and $c = d$, then...

- Reflexive property of equality

$$a = a$$

- Transitive property of equality

$$\begin{array}{l} \text{if } a = b \\ \text{and } b = c \\ \hline \text{then } a = c \end{array}$$

- Symmetric property of equality

$$ab = ba$$

- Substitution Postulate

$$\begin{array}{l} \text{If } y = x + 2 \\ \text{and } x = 3 \\ \hline \text{then } y = 3 + 2 = 5 \end{array}$$

- Addition Postulate

$$\begin{array}{l} \text{If } a = b \\ \text{and } c = d \\ \hline \text{then } a + c = b + d \end{array}$$

- Subtraction Postulate

$$\begin{array}{l} \text{If } a = b \\ \text{and } c = d \\ \hline \text{then } a - c = b - d \end{array}$$

- Multiplication Postulate

$$\begin{array}{l} \text{If } a = b \\ \text{and } c = d \\ \hline \text{then } ac = bd \end{array}$$

- Division Postulate

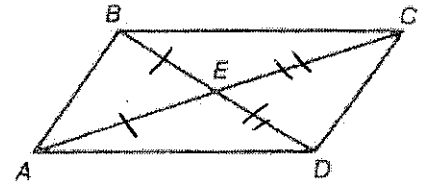
$$\begin{array}{l} \text{If } a = b \\ \text{and } c = d \\ \hline \text{then } \frac{a}{c} = \frac{b}{d} \end{array}$$

- Partition Postulate


$$\overline{AC} = \overline{AB} + \overline{BC}$$

3. Given: $AE = BE$

$CE = DE$



Statement	Reason
① $\overline{AE} = \overline{BE}$ $\overline{CE} = \overline{DE}$	① Given
② $\overline{AE} + \overline{CE} = \overline{BE} + \overline{DE}$ $\overline{AC} = \overline{BD}$	② Addition Postulate

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

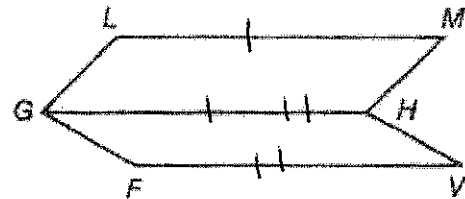
Prove: $7m\angle 1 = 7m\angle 3$

Statement	Reason
① $m\angle 1 = m\angle 3$	① Given
② $7 = 7$	② Reflexive
③ $7m\angle 1 = 7m\angle 3$	③ Multiplication Postulate

5. Given: $LM = GH$

$GH = FV$

Prove: $LM = FV$

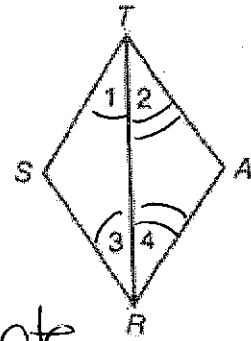


Statement	Reason
① $\overline{LM} = \overline{GH}$ $\overline{GH} = \overline{FV}$	① Given
② $\overline{LM} = \overline{FV}$	② Transitive

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

$m\angle 2 = m\angle 4$

Prove: $m\angle STA = m\angle ARS$

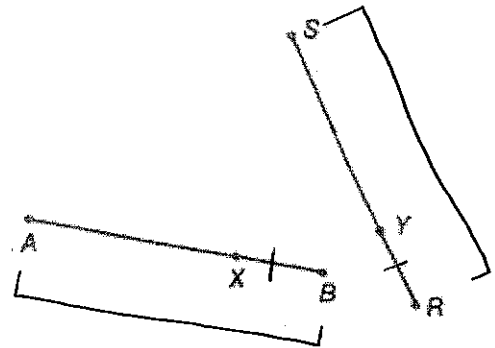


Statement	Reason
① $m\angle 1 = m\angle 3$ $m\angle 2 = m\angle 4$	① Given
② $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$ $m\angle STA = m\angle ARS$	② Addition Postulate

7. Given: $AB = RS$,

$XB = RY$.

Prove: $AX = YS$



Statement	Reason
① $AB = RS$ $XB = RY$	① Given
② $AB - XB = RS - RY$ $AX = YS$	② Subtraction Postulate

8. Given: $AE = BE$

Prove: $\frac{AE}{2} = \frac{BE}{2}$

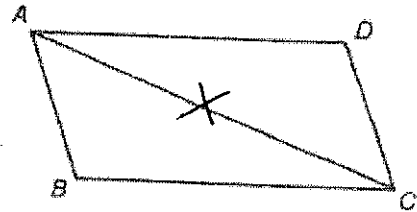
2 2

Statement	Reason
① $AE = BE$	① Given
② $2 = 2$	② Reflexive
③ $\frac{AE}{2} = \frac{BE}{2}$	③ Division Postulate

9. Given: Quadrilateral ABCD

Prove: $AC = AC$

Statement	Reason
① Quadrilateral ABCD	① Given
② $AC = AC$	② Reflexive

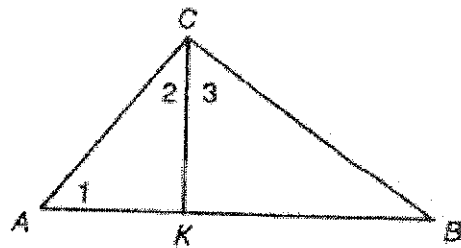


10. Given $m\angle 1 + m\angle 2 = 90$

$m\angle 1 = m\angle 3$

Prove: $m\angle 3 + m\angle 2 = 90$

Statement	Reason
① $m\angle 1 + m\angle 2 = 90$ $m\angle 1 = m\angle 3$	① Give
② $m\angle 3 + m\angle 2 = 90$	② Substitution Postulate

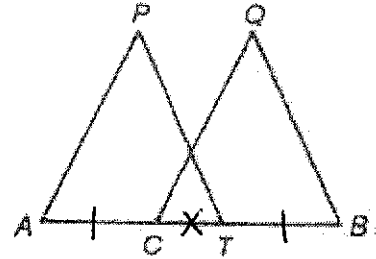


In exercises 11-17, indicate on the diagrams the corresponding pairs of equal or congruent parts. Then state a proof to justify each conclusion.

11. Given: $AC = BT$.

Prove: $AT = BC$.

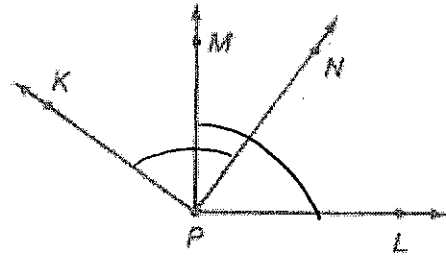
S	R
① $AC = BT$	① Given
② $CT = CT$	② Reflexive
③ $AC + CT = BT + CT$ $AT = BC$	③ Addition Postulate



12. Given: $m\angle KPN = m\angle LPM$

Prove: $m\angle KPM = m\angle LPN$

S	R
① $m\angle KPN = m\angle LPM$	① Given
② $m\angle MPN = m\angle MPN$	② Reflexive
③ $m\angle KPN - m\angle MPN =$ $m\angle LPM - m\angle MPN$ $m\angle KPM = m\angle LPN$	③ Subtraction Postulate

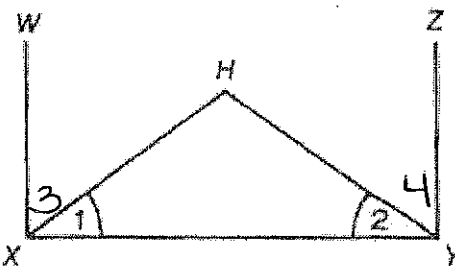


13. Given: $m\angle WXY = m\angle ZYX$

HX bisects $\angle WXY$

HY bisects $\angle ZYX$

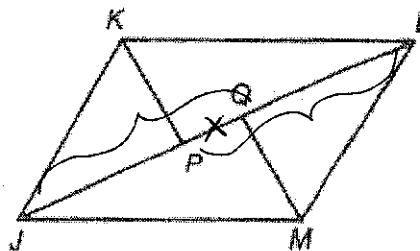
Prove: $m\angle 1 = m\angle 2$



S	R
① $m\angle WXY = m\angle ZYX$ HX bisects $\angle WXY$ HY bisects $\angle ZYX$	① Given
② $\angle 1 \cong \angle 3$ $\angle 2 \cong \angle 4$	② An angle bisector divides an angle into 2 \cong angles
③ $m\angle 1 = m\angle 2$	③ Division Postulate (Halves of \cong angles are \cong)

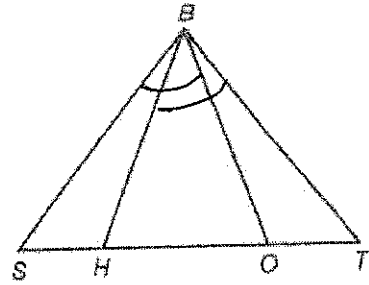
14. Given: $JQ = LP$

Prove: $JP = LQ$



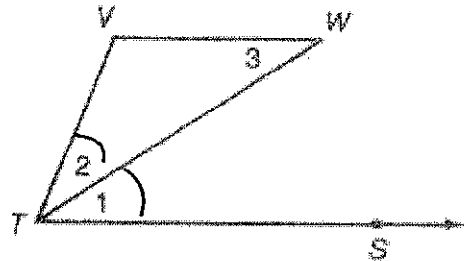
S	R
① $JQ = LP$	① Given
② $QP = QP$	② Reflexive
③ $JQ - QP = LP - QP$ $JP = LQ$	③ Subtraction Postulate

15. Given: $m\angle SBO = m\angle TBH$
 Prove: $m\angle SBH = m\angle TBO$



S	R
① $m\angle SBO = m\angle TBH$	① Given
② $\angle HBO = \angle HBO$	② Reflexive
③ $m\angle SBO - \angle HBO =$ $m\angle TBH - \angle HBO$	③ Subtraction Postulate
$m\angle SBH = m\angle TBO$	

16. Given: TW bisects $\angle STV$
 $\angle 1 = \angle 3$
 Prove: $\angle 2 = \angle 3$



S	R
① TW bisects $\angle STV$	① Given
② $\angle 1 = \angle 2$	② An angle bisector divides an angle into 2 \cong angles
③ $\angle 1 = \angle 3$	③ Given
④ $\angle 2 = \angle 3$	④ Transitive