

• Name the property of equality that justifies each statement.

1. If $m\angle A = m\angle B$, then $m\angle B = m\angle A$.

2. $xy = xy$

3. If $XY - YZ = XM$, then $XY = XM + YZ$.

4. If $m\angle A + m\angle B = 90$, and $m\angle A = 30$, then $30 + m\angle B = 90$.

5. If $x + 3 = 17$, then $x = 14$.

6. If $7x = 42$, then $x = 6$.

7. $2(x + 4) = 2x + 8$.

8. If $x = y + 3$ and $y + 3 = 10$, then $x = 10$.

• In Exercises 9-14, use the property to complete the statement.

9. Substitution Property of Equality:

If $LK + JM = 12$ and $LK = 2$, then $\boxed{?}$.

10. Subtraction Property of Equality:

If $PQ + ST = ST + RS$, then $\boxed{?}$.

11. Reflexive Property of Congruence:

$\angle COD \cong \boxed{?}$.

12. Division Property of Equality:

If $3(m\angle A) = 90^\circ$, then $m\angle A = \boxed{?}$.

13. Symmetric Property of Congruence:

If $\overline{XY} \cong \overline{YZ}$, then $\boxed{?}$.

14. Transitive Property of Congruence:

If $\angle A \cong \boxed{?}$ and $\angle K \cong \boxed{?}$, then $\angle A \cong \angle G$.

Complete each proof.

Given: $AD = 2AB + BC$
 Prove: $AB \cong CD$
 Proof:



Statements	Reasons
a. $AD = 2AB + BC$	a. _____
b. $AD = AB + BC + CD$	b. _____
c. $2AB + BC = AB + BC + CD$	c. _____
d. $\overline{AB} \cong \overline{CD}$	d. _____

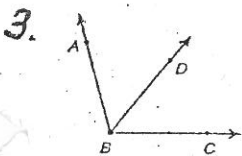
2. Given: $\angle 1$ and $\angle 2$ are supplementary angles.

$m\angle 2 = 40^\circ$

Prove: $m\angle 1 = 140^\circ$

Proof:

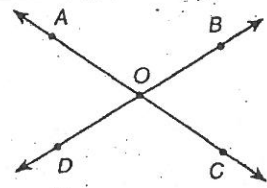
Statements	Reasons
1. $\angle 1$ and $\angle 2$ are supplementary angles.	1. _____
2. $m\angle 1 + m\angle 2 = 180^\circ$	2. _____
3. $m\angle 2 = 40^\circ$	3. _____
4. $m\angle 1 + 40^\circ = 180^\circ$	4. _____
5. $m\angle 1 = 140^\circ$	5. _____



Given: \overrightarrow{BD} bisects $\angle ABC$
 Prove: $m\angle ABD = \frac{1}{2}(m\angle ABC)$

Statement	Reason
1. \overrightarrow{BD} bisects $\angle ABC$	_____
2. $m\angle ABD = m\angle DBC$	_____
3. $m\angle ABD + m\angle DBC = m\angle ABC$	_____
4. $m\angle ABD + m\angle ABD = m\angle ABC$	_____
5. $2(m\angle ABD) = m\angle ABC$	_____
6. $m\angle ABD = \frac{1}{2}m\angle ABC$	_____

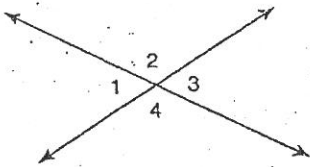
4. Given: $\angle AOC$ and $\angle BOD$ are straight angles
 Prove: $\angle AOB \cong \angle COD$



Statements	Reasons
1. $\angle AOC$ and $\angle BOD$ are straight angles	1. <input type="checkbox"/>
2. $\angle AOC = 180^\circ$	2. <input type="checkbox"/>
3. $\angle BOD = 180^\circ$	3. <input type="checkbox"/>
4. $m\angle AOC = m\angle BOD$	4. <input type="checkbox"/>
5. $m\angle AOB + m\angle BOC = m\angle AOC$	5. <input type="checkbox"/>
6. $m\angle BOC + m\angle COD = m\angle BOD$	6. <input type="checkbox"/>
7. $m\angle AOB + m\angle BOC = m\angle BOC + m\angle COD$	7. <input type="checkbox"/>
8. $m\angle AOB = m\angle COD$	8. <input type="checkbox"/>

Complete the missing portions of the proof.

5.



- Given: $\angle 1$ and $\angle 3$ are vertical angles
 $\angle 2$ and $\angle 4$ are vertical angles
 $\angle 1$ and $\angle 2$ are supplementary
 Prove: $\angle 3$ and $\angle 4$ are supplementary

Statements	Reasons
1. $\angle 1$ and $\angle 3$ are vert. \angle	1. <input type="checkbox"/>
2. <input type="checkbox"/>	2. def. vertical \angle s
4. <input type="checkbox"/>	4. Given
5. $\angle 2 \cong \angle 4$	5. <input type="checkbox"/>
7. $\angle 1$ and $\angle 2$ are supp.	7. <input type="checkbox"/>
8. $m\angle 1 + m\angle 2 = 180^\circ$	8. <input type="checkbox"/>
9. <input type="checkbox"/> + $m\angle 2 = 180^\circ$	9. Substitution
10. $m\angle 3 + m\angle 4 = 180^\circ$	10. <input type="checkbox"/>
11. $\angle 3$ and $\angle 4$ are supp.	11. <input type="checkbox"/>

6.

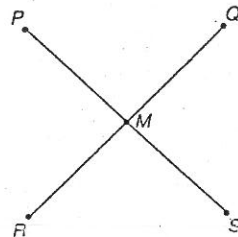


- Given: $PQ = RS$
 $QR = 4, PS = 10$
 Prove: $PQ = 3$

Statements	Reasons
1. $PS = 10, QR = 4, PQ = RS$	1.
2.	2. Segment Addition Post.
3. $PQ + 4 + PQ = 10$	3.
4. $2PQ + 4 = 10$	4.
5.	5. Subtraction Prop. of Equality
6. $PQ = 3$	6.

7.

- Given: $\overline{PS} \cong \overline{RQ}$
 M is the midpoint of \overline{PS} .
 M is the midpoint of \overline{RQ} .
 Prove: $\overline{PM} \cong \overline{RM}$
 Proof:



Statements	Reasons
a. $\overline{PS} \cong \overline{RQ}$ M is the midpoint of \overline{PS} . M is the midpoint of \overline{RQ} .	a. <input type="checkbox"/>
c. <input type="checkbox"/>	c. Definition of midpoint.
d. $PS = PM + MS$ $RQ = RM + MQ$	d. <input type="checkbox"/>
e. $PS = RM + MQ$	e. <input type="checkbox"/>
f. $PM + MS = RM + MQ$	f. <input type="checkbox"/>
g. $PM + PM = RM + RM$	g. <input type="checkbox"/>
h. $2PM = 2RM$	h. <input type="checkbox"/>
i. <input type="checkbox"/>	i. <input type="checkbox"/>