

1. Given: $\frac{4x+6}{2} = 9$

Prove: $x = 3$

Statements	Reasons
① $\frac{4x+6}{2} = 9$	① given
② $4x+6 = 18$	② Multiplication property
③ $4x = 12$	③ subtraction property
④ $x = 3$	④ Division property

2. Given: $\frac{2}{3}(x-2) + 1 = 7$

Prove: $x = 11$

Statements	Reasons
① $\frac{2}{3}(x-2) + 1 = 7$	① given
② $2(x-2) + 3 = 21$	② multiplication property
③ $2x - 4 + 3 = 21$	③ distributive property
④ $2x - 1 = 21$	④ combining like terms
⑤ $2x = 22$	⑤ Addition property
⑥ $x = 11$	⑥ Division property

3. Given: $3x - 4(x + 6) = 3x$

Prove: $x = -6$

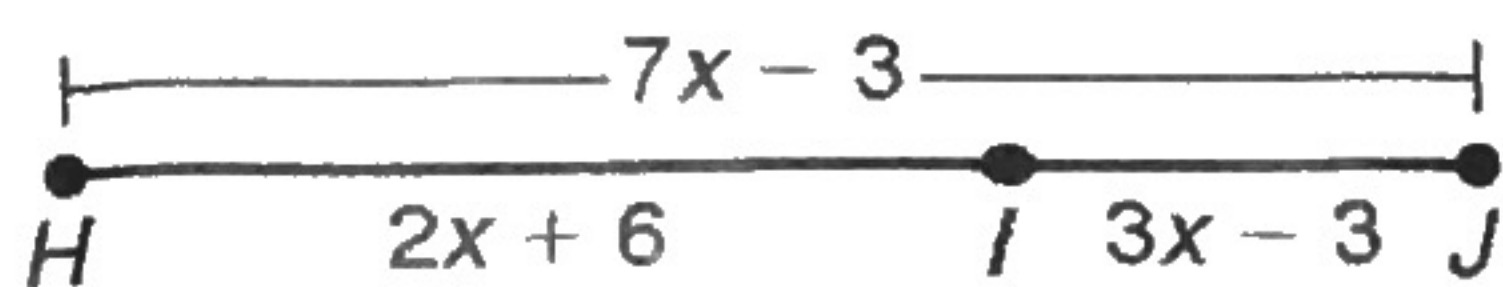
Statements	Reasons
① $3x - 4(x + 6) = 3x$	① given
② $3x - 4x - 24 = 3x$	② Distributive Property
③ $-x - 24 = 3x$	③ combining Like Terms
④ $-24 = 4x$	④ Addition Property
⑤ $-6 = x$	⑤ Division Property
⑥ $x = -6$	⑥ symmetric property

4. Given: $-2x - \frac{3}{8}(x - 4) = -\frac{1}{4}(x + 3) - x$

Prove: $x = 2$

Statements	Reasons
① $-2x - \frac{3}{8}(x - 4) = -\frac{1}{4}(x + 3) - x$	① given
② $-16x - 3(x - 4) = -2(x + 3) - 8x$	② Multiplication Property
③ $-16x - 3x + 12 = -2x - 6 - 8x$	③ Distributive Property
④ $-19x + 12 = -10x - 6$	④ combining Like Terms
⑤ $-9x + 12 = -6$	⑤ Addition Property
⑥ $-9x = -18$	⑥ subtraction Property
⑦ $x = 2$	⑦ Division Property

4. Write a reason for each step.



$$HJ = HI + IJ$$

$$7x - 3 = (2x + 6) + (3x - 3)$$

$$7x - 3 = 5x + 3$$

$$7x = 5x + 6$$

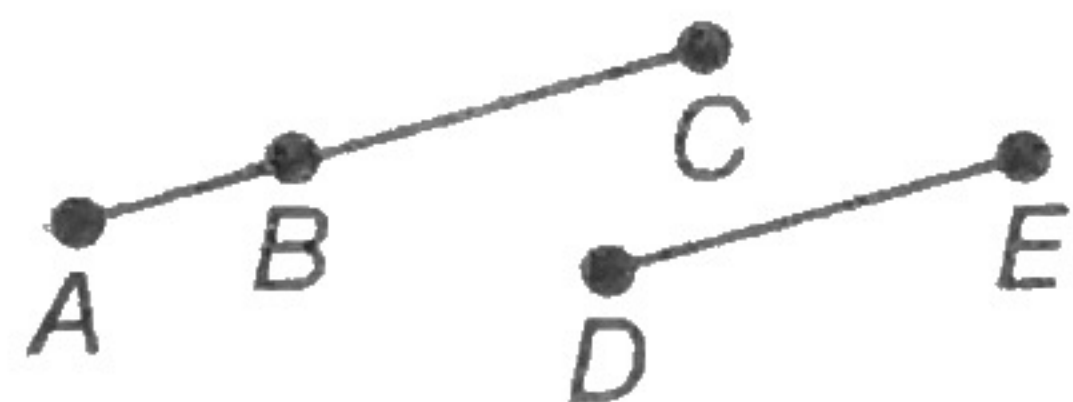
$$2x = 6$$

$$x = 3$$

Segment Addition Property
 Substitution Property
 Combining Like Terms
 Addition Property
 Subtraction Property
 Division Property

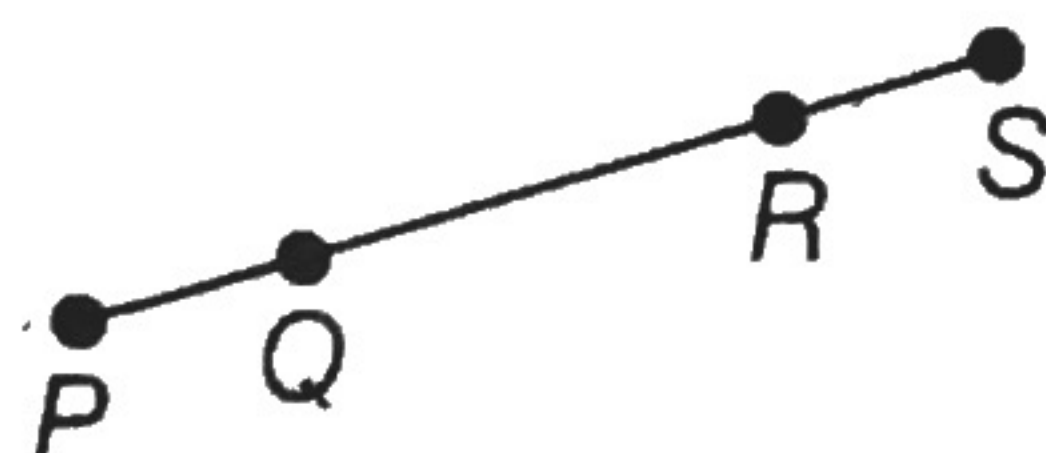
5. Given: $BC = DE$

Prove: $AB + DE = AC$



Statements	Reasons
1. $BC = DE$	1. given
2. $AB + BC = AC$	2. Segment Addition Postulate
3. $AB + DE = AC$	3. Substitution Property

6. Given: Q is between P and R ,
 R is between Q and S , $PR = QS$.



Prove: $PQ = RS$

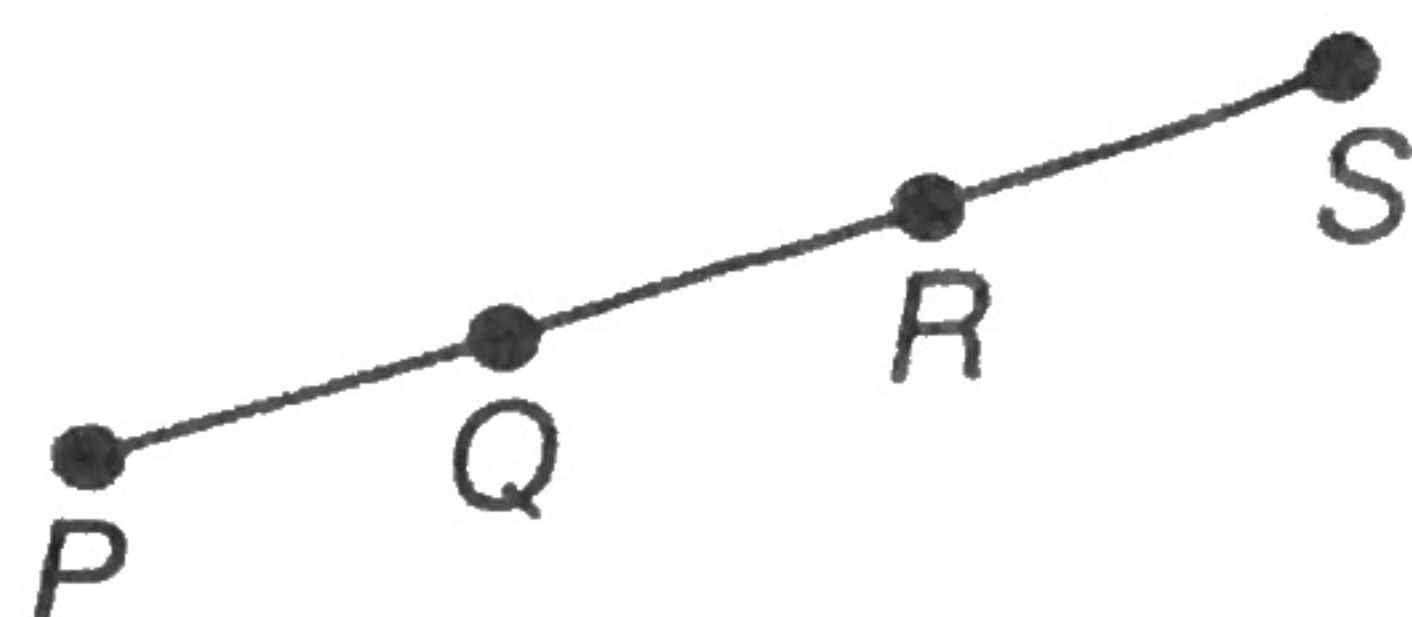
Statements	Reasons
1. Q is between P and R . R is between Q and S	1. Given
2. $PQ + QR = PR$ $QR + RS = QS$	2. Segment Addition Postulate
3. <u>$PR = QS$</u>	3. Given
4. $PQ + \cancel{QR} = \cancel{QR} + RS$	4. Substitution Property
5. $QR = QR$	5. Reflexive Property
6. $PQ = RS$	6. Subtraction Property

7. Given: $\overline{AB} \cong \overline{DE}$

B is the midpoint of $\overline{AC}$.

E is the midpoint of $\overline{DF}$.

Prove: $\overline{BC} \cong \overline{EF}$



Statements

Reasons

a. $\overline{AB} \cong \overline{DE}$
 B is the mdpt of $\overline{AC}$
 E is the mdpt of $\overline{DF}$

a. Given

b. _____

b. Definition of Midpoint

skip.

c. $AB = DE, AB = BC, DE = EF$

c. _____

d. $BC = DE$

d. _____

e. $BC = EF$

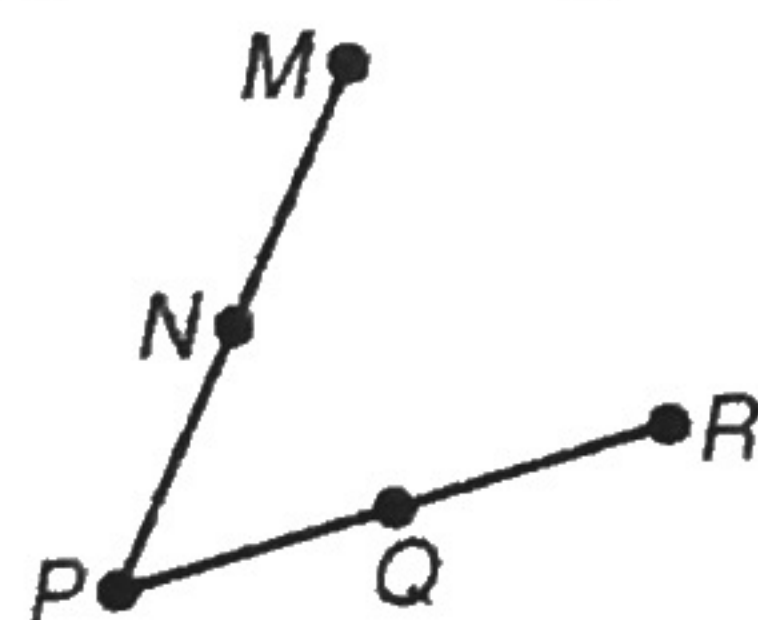
e. _____

f. _____

f. _____

8. Given: N is the midpoint of $\overline{MP}$, Q is the midpoint of $\overline{RP}$, and $\overline{PQ} \cong \overline{NM}$.

Prove: $\overline{PN} \cong \overline{QR}$



Write a justification for each step.

Proof:

1. N is the midpoint of $\overline{MP}$.

2. Q is the midpoint of $\overline{RP}$.

3. $\overline{PN} \cong \overline{NM}$

4. $\overline{PQ} \cong \overline{NM}$

5. $\overline{PN} \cong \overline{PQ}$

6. $\overline{PQ} \cong \overline{QR}$

7. $\overline{PN} \cong \overline{QR}$

1. given

2. given

3. Def. of Midpoint

4. given

5. Transitive Property

6. Def of Midpoint

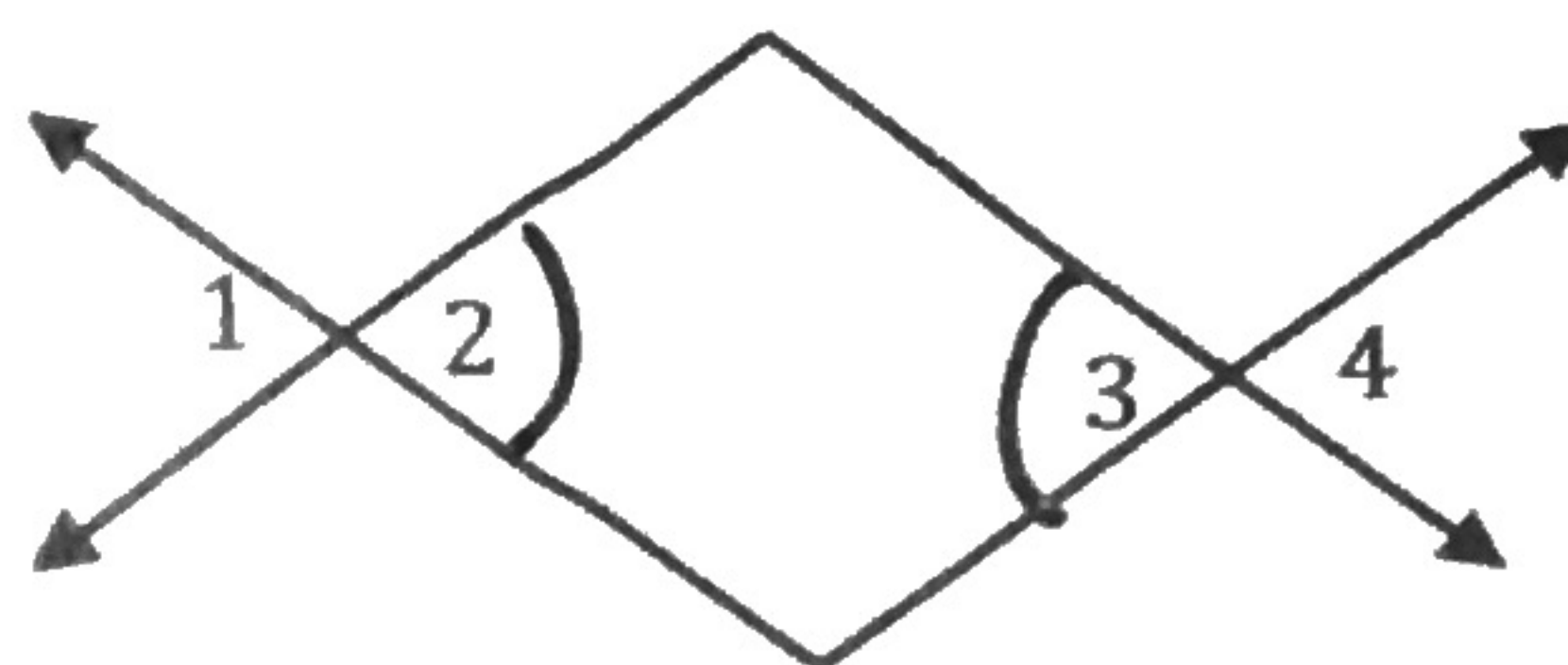
7. Transitive Property

9. Complete the following proof:

Given: $\angle 2 \cong \angle 3$

Prove: $\angle 1 \cong \angle 4$

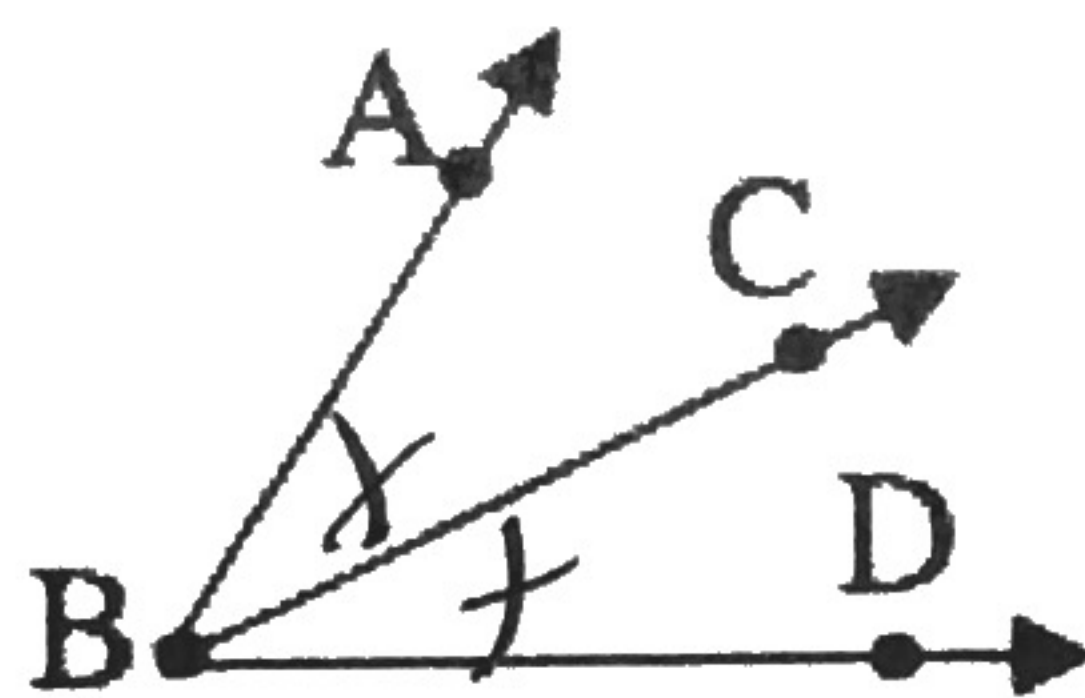
Proof:



Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. Given
2. $\angle 1$ and $\angle 2$ are vertical angles.	2. Definition of Vertical Angles
3. $\angle 3$ and $\angle 4$ are vertical angles	3. def. of Vertical Angles
4. $\angle 1 \cong \angle 2$; $\angle 3 \cong \angle 4$	4. Vertical Angles Theorem
5. $\angle 1 \cong \angle 4$	5. Substitution Property

10. Given: $\angle ABC \cong \angle CBD$

Prove: $\overrightarrow{BC}$ bisects $\angle ABD$



Statements	Reasons
1. $\angle ABC \cong \angle CBD$	1. given
2. $m\angle ABC = m\angle CBD$	2. Definition of congruence
3. $\overrightarrow{BC}$ is an angle bisector	3. Definition of Angle Bisector
4. $\overrightarrow{BC}$ bisects $\angle ABD$	4. Definition of an Angle Bisector