PRACTICE!

Justify each statement below using a property of equality, property of congruence, definition, or postulate.

1. If $PQ = PQ$, then $\overline{PQ} \cong \overline{PQ}$	**1.**
2. If K is between J and L, then $JK + KL = JL$	**2.**
3. $\overline{EF} \cong \overline{EF}$	**3.**
4. If $RS = TU$, then $RS + XY = TU + XY$	**4.**
5. If $AB = DE$, then $DE = AB$	**5.**
6. If Y is the midpoint of $\overline{XZ}$, then $XY = YZ$	**6.**
7. If $\overline{FG} \cong \overline{HI}$ and $\overline{HI} \cong \overline{JK}$, then $\overline{FG} \cong \overline{JK}$	**7.**
8. If $AB + CD = EF + CD$, then $AB = EF$	**8.**
9. If $PQ + RS = TV$ and $RS = WX$, then $PQ + WX = TV$	**9.**
10. If $LP = PN$, and L, P, and N are collinear, then P is the midpoint of $\overline{LN}$	**10.**
11. If $\overline{UV} \cong \overline{UV}$, then $UV = UV$	**11.**
12. If $CD + DE = CE$, then $CD = CE - DE$	**12.**
13. If $2XY = XZ$, then $XY = \frac{1}{2} XZ$	**13.**
14. If $RS = ST$ and $ST = 2UV$, then $RS = 2UV$	**14.**

REASONS BANK

Properties of Equality:

Addition Property
Subtraction Property
Multiplication Property
Division Property
Distributive Property
Substitution Property
Reflexive Property
Symmetric Property
Transitive Property

Properties of Congruence:

Reflexive Property
Symmetric Property
Transitive Property

Definitions:

Definition of Congruence
Definition of Midpoint

Postulates:

Segment Addition Postulate

SEGMENT PROOFS GUIDE

Directions: Use the reasons below to complete proofs 1-6. Cross them off as you use them for each proof.

1

Addition Property
Given
Transitive Property
Definition of Midpoint
Segment Addition Postulate
Simplify

2

Definition of Midpoint
Definition of Congruence
Given
Transitive Property

3

Transitive Property
Substitution Property
Definition of Congruence
Substitution Property
Definition of Congruence
Segment Addition Postulate
Given

4

Given
Substitution Property
Transitive Property
Definition of Midpoint
Given
Definition of Congruence
Symmetric Property

5

Segment Addition Postulate
Transitive Property
Definition of Congruence
Substitution
Given
Definition of Congruence

6

Definition of Congruence
Substitution
Segment Addition Postulate
Given
Segment Addition Postulate
Definition of Congruence
Transitive Property

SEGMENT PROOFS GUIDE

Directions: Use the reasons below to complete proofs 1-6. Cross them off as you use them for each proof.

1

Addition Property
Given
Transitive Property
Definition of Midpoint
Segment Addition Postulate
Simplify

2

Definition of Midpoint
Definition of Congruence
Given
Transitive Property

3

Transitive Property
Substitution Property
Definition of Congruence
Substitution Property
Definition of Congruence
Segment Addition Postulate
Given

4

Given
Substitution Property
Transitive Property
Definition of Midpoint
Given
Definition of Congruence
Symmetric Property

5

Segment Addition Postulate
Transitive Property
Definition of Congruence
Substitution
Given
Definition of Congruence

6

Definition of Congruence
Substitution
Segment Addition Postulate
Given
Segment Addition Postulate
Definition of Congruence
Transitive Property

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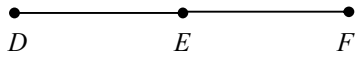
SEGMENT Proofs

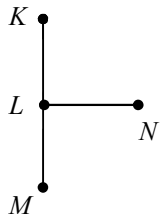
Complete the proofs below by giving the missing statements and reasons.

1 **Given:** E is the midpoint of $\overline{DF}$
Prove: $2DE = DF$



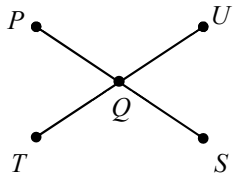
Statements	Reasons
1. E is the midpoint of $\overline{DF}$	**1.**
2. $DE = EF$	**2.**
3. $DE + DE = DE + EF$	**3.**
4. $2DE = DE + EF$	**4.**
5. $DE + EF = DF$	**5.**
6. $2DE = DF$	**6.**

2 **Given:** $\overline{KL} \cong \overline{LN}$, $\overline{LM} \cong \overline{LN}$
Prove: L is the midpoint of $\overline{KM}$



Statements	Reasons
1. $\overline{KL} \cong \overline{LN}$, $\overline{LM} \cong \overline{LN}$	**1.**
2. $KL = LN$, $LM = LN$	**2.**
3. $KL = LM$	**3.**
4. L is the midpoint of $\overline{KM}$	**4.**

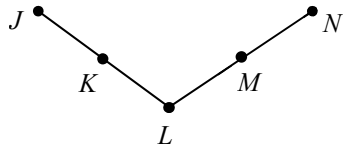
3 **Given:** $\overline{PQ} \cong \overline{TQ}$, $\overline{UQ} \cong \overline{QS}$
Prove: $\overline{PS} \cong \overline{TU}$



Statements	Reasons
1. $\overline{PQ} \cong \overline{TQ}$, $\overline{UQ} \cong \overline{QS}$	**1.**
2. $PQ = TQ$, $UQ = QS$	**2.**
3. $PQ + QS = PS$; $TQ + QU = TU$	**3.**
4. $TQ + QS = PS$	**4.**
5. $TQ + QS = TU$	**5.**
6. $PS = TU$	**6.**
7. $\overline{PS} \cong \overline{TU}$	**7.**

4 **Given:** K is the midpoint of JL, M is the midpoint of LN, $JK = MN$

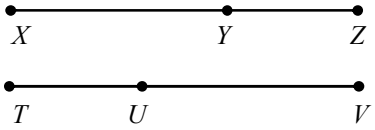
Prove: $\overline{KL} \cong \overline{LM}$



Statements	Reasons
1. K is the midpoint of JL, M is the midpoint of LN	**1.**
2. $JK = KL$, $LM = MN$	**2.**
3. $JK = MN$	**3.**
4. $MN = KL$, $LM = MN$	**4.**
5. $LM = KL$	**5.**
6. $KL = LM$	**6.**
7. $\overline{KL} \cong \overline{LM}$	**7.**

5 **Given:** $\overline{XY} \cong \overline{UV}$, $\overline{YZ} \cong \overline{TU}$

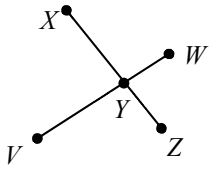
Prove: $\overline{XZ} \cong \overline{TV}$



Statements	Reasons
1. $\overline{XY} \cong \overline{UV}$, $\overline{YZ} \cong \overline{TU}$	**1.**
2. $XY = UV$, $YZ = TU$	**2.**
3. $XY + YZ = XZ$, $TU + UV = TV$	**3.**
4. $UV + YZ = XZ$, $YZ + UV = TV$	**4.**
5. $XZ = TV$	**5.**
6. $\overline{XZ} \cong \overline{TV}$	**6.**

6 **Given:** $\overline{YW} \cong \overline{YZ}$, $\overline{XY} \cong \overline{VY}$

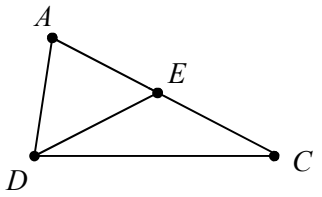
Prove: $\overline{XZ} \cong \overline{VW}$



Statements	Reasons
1. $\overline{WY} \cong \overline{YZ}$, $\overline{XY} \cong \overline{VY}$	**1.**
2. $WY = YZ$, $XY = VY$	**2.**
3. $XY + YZ = XZ$	**3.**
4. $VY + YW = XZ$	**4.**
5. $VY + YW = VW$	**5.**
6. $XZ = VW$	**6.**
7. $\overline{XZ} \cong \overline{VW}$	**7.**

7 **Given:** E is the midpoint of $\overline{AC}$, $DE = EC$

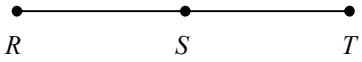
Prove: $\overline{DE} \cong \overline{AE}$



Statements	Reasons
1. E is the midpoint of $\overline{AC}$	**1.**
2.	**2.** Definition of Midpoint
3.	**3.** Given
4. $AE = DE$	**4.**
5.	**5.** Definition of Congruence
6. $\overline{DE} \cong \overline{AE}$	**6.**

8 **Given:** $RS = \frac{1}{2}RT$

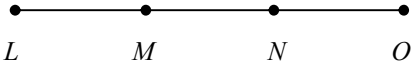
Prove: S is the midpoint of $\overline{RT}$



Statements	Reasons
1. $RS = \frac{1}{2}RT$	**1.**
2. $2RS = RT$	**2.**
3.	**3.** Segment Addition Postulate
4. $2RS = RS + ST$	**4.**
5. $RS = ST$	**5.**
6.	**6.** Definition of Midpoint

9 **Given:** M is the midpoint of $\overline{LN}$,
N is the midpoint of $\overline{MO}$

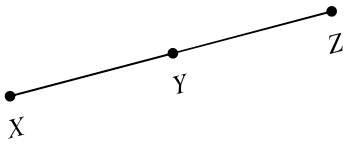
Prove: $\overline{LM} \cong \overline{NO}$



Statements	Reasons
1. M is the midpoint of $\overline{LN}$	**1.**
2. $LM = MN$	**2.** Definition of Midpoint
3.	**3.** Given
4. $MN = NO$	**4.**
5.	**5.** Transitive Property of Equality
6.	**6.** Definition of Congruence

10 **Given:** Y is the midpoint of $\overline{XZ}$

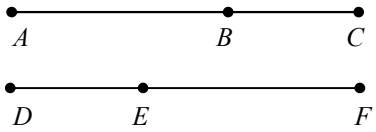
Prove: $XY = \frac{1}{2}XZ$



Statements	Reasons

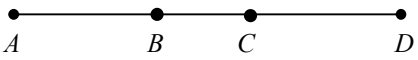
11 **Given:** $\overline{AC} \cong \overline{DF}$, $\overline{BC} \cong \overline{DE}$

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



Statements	Reasons

12 **Given:** $\overline{AB} \cong \overline{CD}$; **Prove:** $\overline{AC} \cong \overline{BD}$



Statements	Reasons