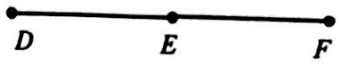
SEGMENTS PROOFS

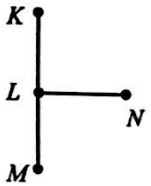
Directions: Complete the proofs below by giving the missing statements and reasons.

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



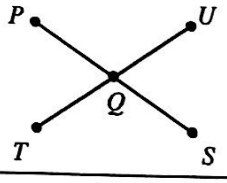
Statements	Reasons
1. E is the midpoint of $\overline{DF}$	1. given
2. $DE = EF$	2. def MP
3. $DE + DE = DE + EF$	3. addition
4. $2DE = DE + EF$	4. CLT / simplify
5. $DE + EF = DF$	5. segment addition
6. $2DE = DF$	6. transitive

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



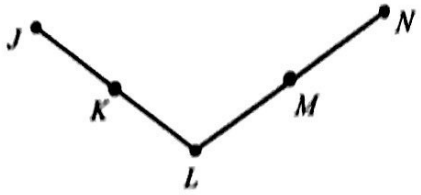
Statements	Reasons
1. $\overline{KL} \cong \overline{LN}$, $\overline{LM} \cong \overline{LN}$	1. given
2. $KL = LN$, $LM = LN$	2. def of $\cong$
3. $KL = LM$	3. substitution
4. L is the midpoint of $\overline{KM}$	4. def of MP

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



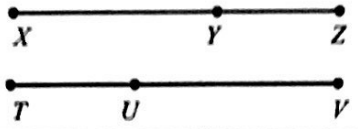
Statements	Reasons
1. $\overline{PQ} \cong \overline{TQ}$, $\overline{UQ} \cong \overline{QS}$	1.
2. $PQ = TQ$, $UQ = QS$	2.
3. $PQ + QS = PS$; $TQ + QU = TU$	3.
4. $TQ + QS = PS$	4.
5. $TQ + QS = TU$	5.
6. $PS = TU$	6.
7. $\overline{PS} \cong \overline{TU}$	7.

4 **Given:** K is the midpoint of $\overline{JL}$, M is the midpoint of $\overline{LN}$,
$JK = MN$
Prove: $\overline{KL} \cong \overline{LM}$



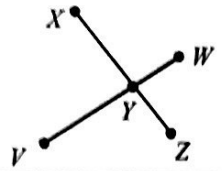
Statements	Reasons
1. K is the midpoint of $\overline{JL}$, M is the midpoint of $\overline{LN}$	1.
2. $JK = KL$, $LM = MN$	2.
3. $JK = MN$	3.
4. $MN = KL$, $LM = MN$	4.
5. $LM = KL$	5.
6. $KL = LM$	6.
7. $\overline{KL} \cong \overline{LM}$	7.

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



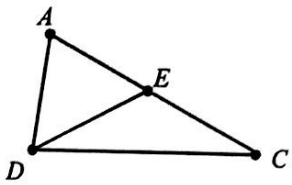
Statements	Reasons
1. $\overline{XY} \cong \overline{UV}$, $\overline{YZ} \cong \overline{TU}$	1.
2. $XY = UV$, $YZ = TU$	2.
3. $XY + YZ = XZ$, $TU + UV = TV$	3.
4. $UV + YZ = XZ$, $YZ + UV = TV$	4.
5. $XZ = TV$	5.
6. $\overline{XZ} \cong \overline{TV}$	6.

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



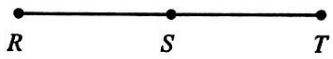
Statements	Reasons
1. $\overline{WY} \cong \overline{YZ}$, $\overline{XY} \cong \overline{VY}$	1.
2. $WY = YZ$, $XY = VY$	2.
3. $XY + YZ = XZ$	3.
4. $VY + YW = XZ$	4.
5. $VY + YW = VW$	5.
6. $XZ = VW$	6.
7. $\overline{XZ} \cong \overline{VW}$	7.

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. given
2. $AE = EC$	2. Definition of Midpoint
3. $DE = EC$	3. Given
4. $AE = DE$	4. transitive / substitution
5. $\overline{AE} \cong \overline{DE}$	5. Definition of Congruence
6. $\overline{DE} \cong \overline{AE}$	6. symmetric

8 **Given:** $RS = \frac{1}{2}RT$
Prove: S is the midpoint of $\overline{RT}$



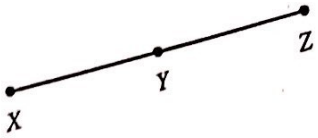
Statements	Reasons
1. $RS = \frac{1}{2}RT$	1. given
2. $2RS = RT$	2. multiplication
3. $RS + ST = RT$	3. Segment Addition Postulate
4. $2RS = RS + ST$	4. transitive
5. $RS = ST$	5. subtraction
6. S is the MP of $\overline{RT}$	6. Definition of Midpoint

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 $\overline{XZ}$

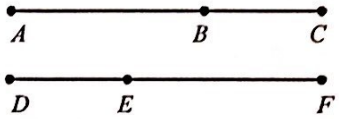
Prove: $XY = \frac{1}{2}XZ$



Statements	Reasons
Y is the MP of $\overline{XZ}$	given
$XY = YZ$	def of MP
$XY + YZ = XZ$	Segment addition
$XY + XY = XZ$	substitution
$2XY = XZ$	CLT/ simplify
$XY = \frac{1}{2}XZ$	division

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