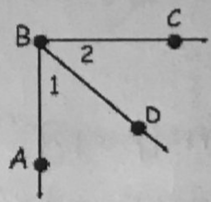
First Semester Review-Proofs **Name:** Mrs. MacDonald

Complete each of the following proofs.

1. Given: $\angle 1$ and $\angle 2$ are complementary
$\overrightarrow{BD}$ bisects $\angle ABC$

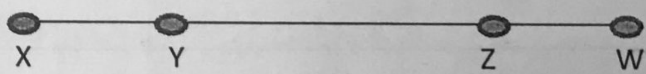
Prove: $m\angle 2 = 45°$



Statements	Reasons
$\angle 1$ and $\angle 2$ are complementary	Given
$m\angle 1 + m\angle 2 = 90°$	def. of complementary
$\overrightarrow{BD}$ bisects $\angle ABC$	Given
$\angle 1 \cong \angle 2$	def. of angle bisector
$m\angle 1 = m\angle 2$	def. of congruent
$m\angle 2 + m\angle 2 = 90°$	Substitution
$2(m\angle 2) = 90°$	distributive or combine like terms
$m\angle 2 = 45°$	Division

2. Given: $\overline{XY} \cong \overline{ZW}$

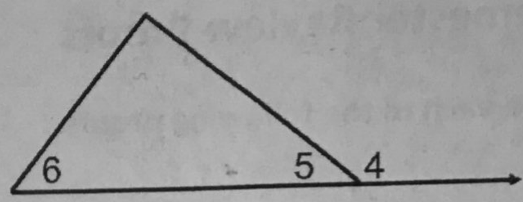
Prove: $\overline{XZ} \cong \overline{YW}$



$\overline{XY} \cong \overline{ZW}$	Given
XY = ZW	Def. of congruent
XY + YZ = XZ	Segment Addition Postulate
YZ + ZW = YW	Segment Addition Postulate
ZW + YZ = XZ	Substitution
XZ = YW	Transitive/Substitution
$\overline{XZ} \cong \overline{YW}$	Def. of congruent

3. Given: $m\angle 4 + m\angle 6 = 180^\circ$

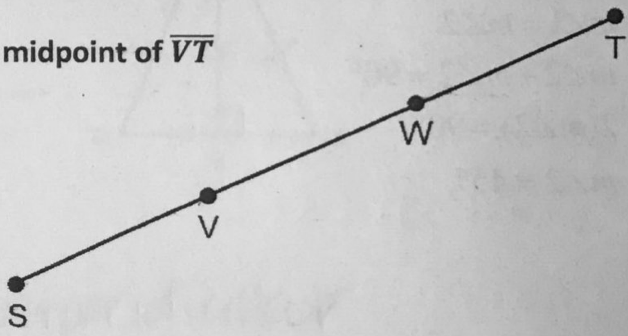
Prove: $m\angle 5 = m\angle 6$



Statement	Reason
1. m<4 + m<6 = 180°	1. Given
2. m<4 + m<5 = 180°	2. Linear pair postulate
3. m<4 + m<5 = m<4 + m<6	3. Transitive / Substitution
4. m<5 = m<6	4. Subtraction

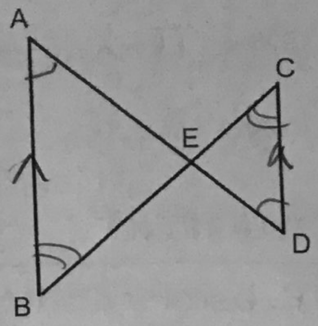
4. Given: V is the midpoint of $\overline{SW}$, and W is the midpoint of $\overline{VT}$

Prove: $\overline{SV} \cong \overline{WT}$



1. V is the midpoint of $\overline{SW}$	1. Given
2. W is the midpoint of $\overline{VT}$	2. Given
3. $\overline{SV} \cong \overline{VW}$	3. Definition of Midpoint
4. $\overline{VW} \cong \overline{WT}$	4. Definition of Midpoint
5. $\overline{SV} \cong \overline{WT}$	5. Transitive Property of Congruence

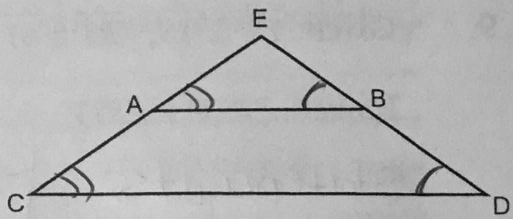
5. Given: $\overline{AB} \parallel \overline{CD}$



Prove: $\Delta ABE \cong \Delta DCE$

Statement:	Reason:
1. $\overline{AB} \parallel \overline{CD}$	1. Given
2. $\angle A \cong \angle D$	2. Alternate interior angles theorem
3. <B ≅ <C	3. Alternate interior angles
4. $\Delta ABE \cong \Delta DCE$	4. AA

6. Given: $\overline{AB} \parallel \overline{CD}$

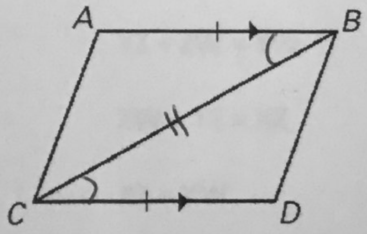


Prove: $\Delta ABE \cong \Delta CDE$

Statement:	Reason:
1. $\overline{AB} \parallel \overline{CD}$	1. Given
2. $\angle EAB \cong \angle C$	2. Corresponding angles theorem
3. <ABE ≅ <D	3. Corresponding angles
4. $\Delta ABE \cong \Delta CDE$	4. AA

7. **Given:** $\overline{AB} \parallel \overline{CD}, \overline{AB} \cong \overline{CD}$

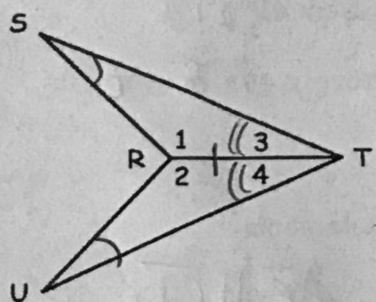
Prove: $\Delta ABC \cong \Delta DCB$



Statements	Reasons
$\overline{AB} \parallel \overline{CD}$	Given
$\overline{AB} \cong \overline{CD}$	Given
$\angle ABC \cong \angle DCB$	Alt. Int. Angles
$\overline{BC} \cong \overline{BC}$	Reflexive
$\Delta ABC \cong \Delta DCB$	SAS

8. Given: $\overline{TR}$ bisects $\angle STU$ and $\angle S \cong \angle U$

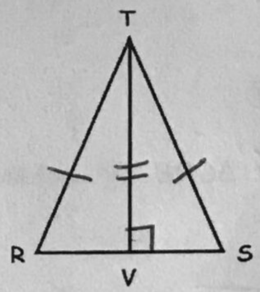
Prove: $\overline{UR} \cong \overline{SR}$



Statement	Reasons
$\overline{TR}$ bisects $\angle STU$	Given
$\angle S \cong \angle U$	Given
$\angle 3 \cong \angle 4$	Def. of bisector
$\overline{RT} \cong \overline{RT}$	Reflexive
$\triangle STR \cong \triangle UTR$	AAS
$\overline{UR} \cong \overline{SR}$	CPCTC

9. Given: $\overline{TV} \perp \overline{RS}$; $\overline{RT} \cong \overline{ST}$

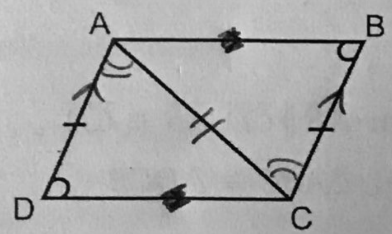
Prove: $\angle RTV \cong \angle STV$



Statements	Reasons
$\overline{TV} \perp \overline{RS}$	Given
$\overline{RT} \cong \overline{ST}$	Given
$\angle RVT$ & $\angle SVT$ are right angles	Def. of perpendicular
$\overline{TV} \cong \overline{TV}$	Reflexive
$\triangle RTV \cong \triangle STV$	HL
$\angle RTV \cong \angle STV$	CPCTC

10. Given: $\overline{BC} \parallel \overline{DA}, \overline{BC} \cong \overline{DA}$, $\angle D \cong \angle B$

Prove: *ABCD is a parallelogram*



Statements	Reasons
$\overline{BC} \parallel \overline{DA}$	Given
$\overline{BC} \cong \overline{DA}$	Given
$\angle D \cong \angle B$	Given
$\angle DAC \cong \angle BCA$	Alt. Int. Angles
$\overline{AC} \cong \overline{AC}$	Reflexive (optional step)
$\triangle DAC \cong \triangle BCA$	ASA
$\overline{AB} \cong \overline{DC}$	CPCTC
ABCD is a ▱	opposite sides ≅