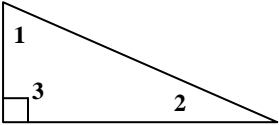
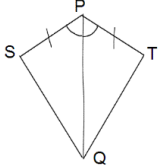


Sample Proofs – Below are examples of some typical proofs that we cover in Geometry and Geometry XL classes. We have left the proofs blank so you can have a go at doing the proofs yourself. The solutions are at the end of the document.

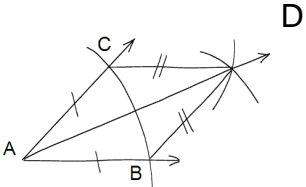
Proof #1

<p>Given: a triangle with $m\angle 3 = 90^\circ$</p> <p>Prove: $\angle 1$ and $\angle 2$ are complementary</p>	
Statements	Reasons
<p>1. $m\angle 3 = 90^\circ$</p>	<p>1. Given</p>

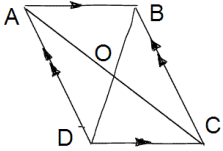
Proof #2

<p>Given: PQ bisects $\angle SPT$, $SP \cong PT$</p> <p>Prove: $\triangle SPQ \cong \triangle TPQ$</p>	
Statements	Reasons
<p>1. PQ bisects $\angle SPT$, $SP \cong PT$</p>	<p>1. Given</p>

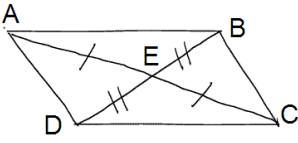
Proof #3

	<p>Given: $AB \cong AC$, $BD \cong CD$</p> <p>Prove: AD bisects $\angle CAB$</p>
Statements	Reasons
<p>1. $AB \cong AC$, $BD \cong CD$</p>	<p>1. Given</p>

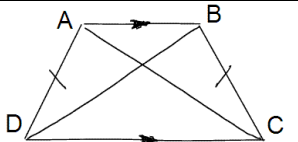
Proof #4

<p>Given: p'gram ABCD w/ diagonals AC & BD</p> <p>Prove: $AO \cong OC$ and $DO \cong OB$</p>	
<p>Statements</p>	<p>Reasons</p>
<p>1. p'gram ABCD w/ diagonals AC & BD</p>	<p>1. Given</p>

Proof #5

<p>Given: $AE \cong EC$, $DE \cong EB$</p> <p>Prove: ABCD is a p'gram</p>	
<p>Statements</p>	<p>Reasons</p>
<p>1. $AE \cong EC$, $DE \cong EB$</p>	<p>1. Given</p>
<p>ABCD is a p'gram</p>	<p>Defn of a p'gram</p>

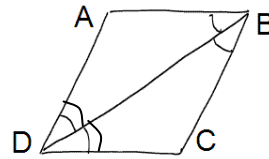
Proof #6

<p>Given: trapezoid ABCD</p> <p>$AD \cong BC$</p> <p>Prove: $AC \cong BD$</p>	
<p>Statements</p>	<p>Reasons</p>

Proof #7

Given: p'gram ABCD
 $\angle CBD \cong \angle ABD$, $\angle BDC \cong \angle BDA$

Prove: ABCD is a rhombus



Statements

Reasons

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Solutions

Proof #1

Given: a triangle with $m\angle 3 = 90^\circ$	
Prove: $\angle 1$ and $\angle 2$ are complementary	
Statements	Reasons
1. $m\angle 3 = 90^\circ$	1. Given
2. $m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$	2. Sum of \angle 's for a Δ
3. $m\angle 1 + m\angle 2 + 90^\circ = 180^\circ$	3. Substitution
4. $m\angle 1 + m\angle 2 = 90^\circ$	4. Subt. Prop. of equality
5. $\angle 1$ and $\angle 2$ are complementary	5. Defn of comp. \angle 's

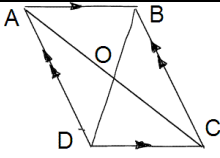
Proof #2

Given: \overline{PQ} bisects $\angle SPT$, $\overline{SP} \cong \overline{PT}$	
Prove: $\triangle SPQ \cong \triangle TPQ$	
Statements	Reasons
1. \overline{PQ} bisects $\angle SPT$	1. Given
2. $\overline{SP} \cong \overline{PT}$	2. Given
3. $\angle SPQ \cong \angle QPT$	3. Defn of \angle bisector
4. $\overline{PQ} \cong \overline{PQ}$	4. Reflexive prop. of congruence
5. $\triangle SPQ \cong \triangle TPQ$	5. SAS congruence postulate

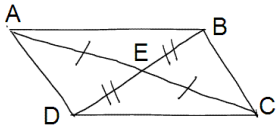
Proof #3

	Given: $\overline{AB} \cong \overline{AC}$, $\overline{BD} \cong \overline{CD}$
	Prove: \overline{AD} bisects $\angle CAB$
Statements	Reasons
1. $\overline{AB} \cong \overline{AC}$, $\overline{BD} \cong \overline{CD}$	1. Given
2. $\overline{AD} \cong \overline{AD}$	2. Reflexive prop. of congruence
3. $\triangle ACD \cong \triangle ABD$	3. SSS congruence postulate
4. $\angle CAD \cong \angle BAD$	4. CPCTC
5. \overline{AD} bisects $\angle CAB$	5. Defn of angle bisector

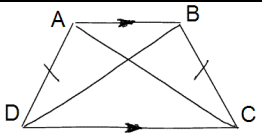
Proof #4

<p>Given: p'gram ABCD w/ diagonals \overline{AC} & \overline{BD}</p> <p>Prove: $\overline{AO} \cong \overline{OC}$ and $\overline{DO} \cong \overline{OB}$</p>	
Statements	Reasons
1. p'gram ABCD w/ diagonals \overline{AC} & \overline{BD}	1. Given
2. $\overline{AB} \parallel \overline{DC}$	2. Defn of parallelogram
3. $\angle BAO \cong \angle DCO$ and $\angle ABO \cong \angle CDO$	3. Alt Int \angle 's \cong
4. $\overline{AB} \cong \overline{CD}$	4. Opposite sides of a p'gram \cong
5. $\triangle ABO \cong \triangle DCO$	5. ASA congruence theorem
6. $\overline{AO} \cong \overline{OC}$ and $\overline{DO} \cong \overline{OB}$	6. CPCTC

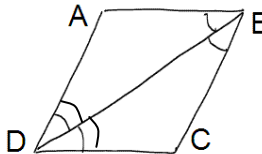
Proof #5

<p>Given: $\overline{AE} \cong \overline{EC}$ and $\overline{DE} \cong \overline{EB}$</p> <p>Prove: ABCD is a p'gram</p>	
Statements	Reasons
1. $\overline{AE} \cong \overline{EC}$ and $\overline{DE} \cong \overline{EB}$	1. Given
2. $\angle BEC \cong \angle AED$	2. Vertical \angle 's \cong
3. $\triangle BEC \cong \triangle AED$	3. SAS congruence postulate
4. $\angle CBE \cong \angle ADE$	4. CPCTC
5. $\overline{BC} \parallel \overline{AD}$	5. Alt int \angle 's $\cong \rightarrow$ lines \parallel
6. $\angle AEB \cong \angle CED$	6. Vertical \angle 's \cong
7. $\triangle AEB \cong \triangle CED$	7. SAS congruence postulate
8. $\angle DCE \cong \angle BAE$	8. CPCTC
9. $\overline{AB} \parallel \overline{DC}$	9. Alt int \angle 's $\cong \rightarrow$ lines \parallel
10. ABCD is a p'gram	10. Defn of a parallelogram

Proof #6

Given: trapezoid ABCD with $\overline{AD} \cong \overline{BC}$	
Prove: $\overline{AC} \cong \overline{BD}$	
Statements	Reasons
1. Trapezoid ABCD, $\overline{AD} \cong \overline{BC}$	1. Given
2. ABCD is isosceles Trapezoid	2. Definition of isosceles trapezoid
3. $\overline{DC} \cong \overline{DC}$	3. Reflexive prop of \cong
4. $\angle BCD \cong \angle ADC$	4. Base \angle 's in an isos. trapezoid are \cong
5. $\triangle BCD \cong \triangle ADC$	5. SAS
6. $\overline{AC} \cong \overline{BD}$	6. CPCTC

Proof #7

Given: p'gram ABCD $\angle CBD \cong \angle ABD, \angle BDC \cong \angle BDA$	
Prove: ABCD is a rhombus	
Statements	Reasons
1. p'gram ABCD	1. Given
2. $\angle CBD \cong \angle ABD, \angle BDC \cong \angle BDA$	2. Given
3. $\overline{BD} \cong \overline{BD}$	3. Reflexive prop of \cong
4. $\triangle BCD \cong \triangle BAD$	4. ASA congruence theorem
5. $\overline{CD} \cong \overline{AD}$	5. CPCTC
6. $\overline{BC} \cong \overline{AB}$	6. CPCTC
7. $\overline{CD} \cong \overline{AB}, \overline{AD} \cong \overline{BC}$	7. Opposite sides of parallelogram are congruent
8. $\overline{AB} \cong \overline{BC} \cong \overline{AD} \cong \overline{CD}$	8. Transitive prop of \cong
9. ABCD is a rhombus	9. Defn of a rhombus