

Acc Geometry
4.6 Isosceles & Equilateral Proof Practice

Name Key
Date _____

Do pg. 258 #5-10, 16-27, 32, 35 (see bottom of page)

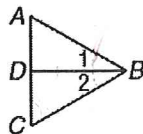
1.

Write a two-column proof.

Given: $\triangle ABC$ is equilateral; $\angle 1 \cong \angle 2$.

Prove: $\angle ADB \cong \angle CDB$

Proof:



WTS $\triangle ADB \cong \triangle CDB$

Statements	Reasons
①. $\triangle ABC$ is equilateral $\angle 1 \cong \angle 2$	② given
②. $\angle A \cong \angle C$	②. An equilateral \triangle is equiangular
③. $\overline{DB} \cong \overline{DB}$	③. Reflexive
④. $\triangle ADB \cong \triangle CDB$	④. AAS
⑤. $\angle ADB \cong \angle CDB$	⑤. CPCTC

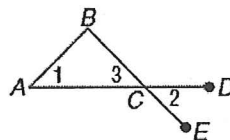
2.

Write a two-column proof.

Given: $\angle 1 \cong \angle 2$

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

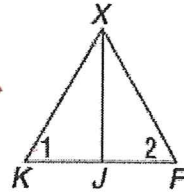
WTS $\angle 1 \cong \angle 3$



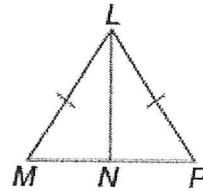
Statements	Reasons
①. $\angle 1 \cong \angle 2$	① given
②. $\angle 2 = \angle 3$	② Vertical \angle s are \cong
③. $\angle 1 = \angle 3$	③ Transitive
④. $\overline{AB} \cong \overline{CB}$	④. If base \angle s are \cong , then the legs are \cong

- ⑤. $\angle LTR \cong \angle LRT$ ⑧. $\overline{LX} \cong \overline{LY}$ ⑩. $\overline{LY} \cong \overline{LW}$ ⑬. 20 ⑮. 36.5 ⑰. 56 ⑲. 18
- ⑥. $\angle LXW \cong \angle LWX$ ⑪. $\overline{LS} \cong \overline{LR}$ ⑫. 140 ⑭. 30.5 ⑯. 68 ⑳. 17 ㉑. 17
- ⑦. $\angle LSQ \cong \angle LQS$ ⑬. 81 ⑭. 28 ⑮. 38 ⑯. 26 ⑰. 38 ㉒. 26
- ⑰. 106 ⑲. 124 ㉑. 111

3.

Given: $\triangle XKF$ is equilateral. \overline{XJ} bisects $\angle X$.Prove: J is the midpoint of \overline{KF} .WTS $KJ \cong FJ$ 

Statement	Justification
①. $\triangle XKF$ is equilateral \overline{XJ} bisects $\angle X$	① given
②. $\angle 1 \cong \angle 2$	②. An equilateral \triangle is equiangular
③. $\angle KXJ \cong \angle FXJ$	③. Def of \angle bisector
④. $\overline{XJ} \cong \overline{XJ}$	④ Reflexive
⑤. $\triangle KXJ \cong \triangle FXJ$	⑤. AAS
⑥. $\overline{KJ} \cong \overline{FJ}$	⑥ CPCTC
⑦. J is the midpoint of \overline{KF}	⑦. Def of midpoint

4. Given: $\triangle MLP$ is isosceles. N is the midpoint of \overline{MP} .Prove: $\overline{LN} \perp \overline{MP}$ WTS $\angle LNP = 90^\circ$
or $\angle LNM = 90^\circ$

Statements	Justifications
①. $\triangle MLP$ is isosceles N is midpoint of \overline{MP}	① given
②. $\overline{LM} \cong \overline{LP}$	② Def of isosceles \triangle
③. $\overline{MN} \cong \overline{PN}$	③. Def of midpoint
④. $\angle M \cong \angle P$	④ Base \angle s of an isosceles \triangle are \cong
⑤. $\triangle LMN \cong \triangle LPN$	⑤. SAS
⑥. $\angle LNM + \angle LNP = 180$	⑥ Def of linear pair
⑦. $\angle LNM \cong \angle LNP$	⑦ CPCTC
⑧. $\angle LNM + \angle LNM = 180$	⑧ Substitution
⑨. $2\angle LNM = 180$	⑨ Substitution (CLT)
⑩. $\angle LNM = 90$	⑩ Division
⑪. $\overline{LN} \perp \overline{MP}$	⑪ Def of \perp