

GUIDED NOTES: Proofs with Lines and Triangles

What can we use to prove?	
Def. of Vertical Angles <del><math>\cong</math></del> *	Linear Pair Postulate make a line (180°) Corresponding Angle Postulate <del><math>\cong</math></del> *
Def. of Supplementary Angles add to = 180	Def. of Bisect cuts in $\frac{1}{2}$ *
Def. of Parallel Lines never cross $\parallel$	Alternate Exterior Angle Theorem <del><math>\cong</math></del> *
Def. of Perpendicular Lines cross to make a 90° angle $\perp$	Alternate Interior Angle Theorem <del><math>\cong</math></del> *
Reflexive Property (AB = AB) equal to itself (shared)	Transitive Property (a = b, b = c, then a = c)
	Substitution Property replace w/ something if is equal to
	Angle Addition Postulate add angles
	Segment Addition Postulate add segments

EX1. Given: a || b and c || d  
Prove:  $\angle 1 \cong \angle 13$

- Statement Reason
- 1) a || b & c || d
  - 2)  $\angle 1 \cong \angle 5$
  - 3)  $\angle 5 \cong \angle 13$
  - 4)  $\angle 1 \cong \angle 13$

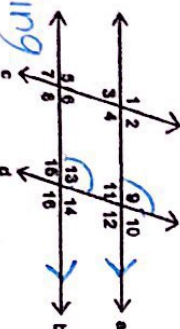
- Reason
- 1) given
  - 2) corresponding angles
  - 3) corresponding angles
  - 4) transitive property



EX2. Given a || b  
Prove:  $m\angle 8 + m\angle 14 = 180^\circ$

- Statement Reason
- 1) a || b
  - 2)  $\angle 9 \cong \angle 13$
  - 3)  $m\angle B + m\angle 9 = 180$
  - 4)  $m\angle 9 + m\angle 14 = 180$

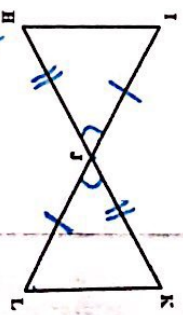
- Reason
- 1) given
  - 2) corresponding angles
  - 3) linear pair (supp)
  - 4) substitution



EX3. Given: J is the midpoint of IL  
Prove:  $\triangle JH \cong \triangle LK$

- Statement Reason
- 1) J is the midpoint of IL. J is the midpoint of HK.
  - 2)  $\overline{JH} \cong \overline{JL}$
  - 3)  $\overline{HJ} \cong \overline{JK}$
  - 4)  $\angle 15H \cong \angle KJL$
  - 5)  $\triangle 15H \cong \triangle LK$

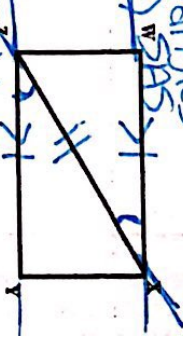
- Reason
- 1) given
  - 2) defn midpoint
  - 3) defn midpoint
  - 4) vertical angles
  - 5) SAS



EX4. Given:  $WX \parallel YZ$ ,  $WX \cong YZ$   
Prove:  $\triangle WXZ \cong \triangle YZX$

- Statement Reason
- 1)  $WX \parallel YZ$ ,  $WX \cong YZ$
  - 2)  $\angle X \cong \angle Z$
  - 3)  $\angle W \cong \angle Y$
  - 4)  $\triangle WXZ \cong \triangle YZX$

- Reason
- 1) given
  - 2) reflexive property
  - 3) alternate interior angles
  - 4) SAS



EX5. Given:  $\overline{JM}$  bisects  $\angle J$   
Prove:  $\triangle JMK \cong \triangle JML$

- Statement Reason
- 1)  $\overline{JM}$  bisects  $\angle J$
  - 2)  $\triangle JMK \perp \overline{KL}$
  - 3)  $\angle KJM \cong \angle LJM$
  - 4)  $\triangle JMK \cong \triangle JML$

- Reason
- 1) given
  - 2) defn bisect
  - 3) perpendicular lines
  - 4) reflexive property

