

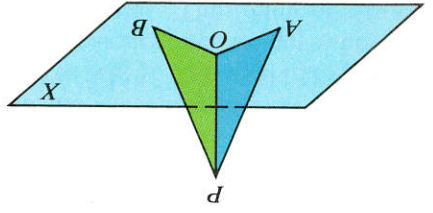
also given that $m\angle D =$
out \overline{CD} and \overline{GF} ?

Two Segments Congruent

the two segments or angles are congruent, supporting the statement with \cong are \cong .

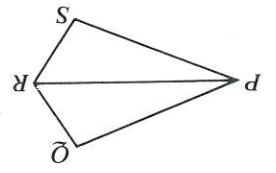
1. Given
2. Def. of a line perpendicular to a plane
3. Def. of \perp lines and def. of rt. \angle
4. Given
5. Reflexive Prop.
6. SAS Postulate
7. Corr. parts of $\cong \triangle$ are \cong .

$\overline{PA} \cong \overline{PB}$ by showing that $\triangle PAO$ and $\triangle PBO$ are



Reasons

3. Supply the reasons.
Given: \overline{RP} bisects $\angle QRS$ and $\angle QPS$.
Prove: $\overline{RQ} \cong \overline{RS}$



Statements

1. \overline{RP} bisects $\angle QRS$ and $\angle QPS$.
2. $\angle QRP \cong \angle SRP$; $\angle QPR \cong \angle SPR$
3. $\overline{RP} \cong \overline{RP}$
4. $\triangle QRP \cong \triangle SRP$
5. $\overline{RQ} \cong \overline{RS}$

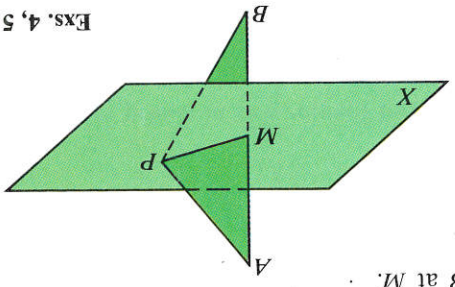
1. ?
2. ?
3. ?
4. ?
5. ?

Reasons

4. Given: M is the midpoint of \overline{AB} ; plane $X \perp \overline{AB}$ at M .

What can you deduce about the figure? Explain your plan for proving that your conclusion is correct.

5. In Exercise 4, suppose \overline{QO} is some point in plane X but not on \overline{MP} . Locate such a point in a diagram on the chalkboard. Then join \overline{QO} to points A , B , M , and P . Now what more can you prove about the figure?



Exs. 4, 5

Proof:

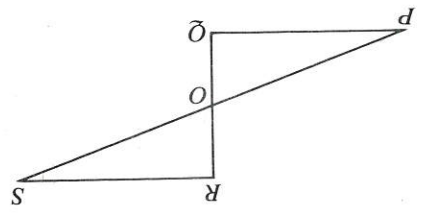
1. $\angle P \cong \angle S$
2. O is the midpoint of \overline{PS} .
3. $\overline{PO} \cong \overline{SO}$
4. $\angle POQ \cong \angle SOR$
5. $\triangle POQ \cong \triangle SOR$
6. $\overline{QO} \cong \overline{RO}$
7. O is the midpoint of \overline{RQ} .

Statements

Reasons

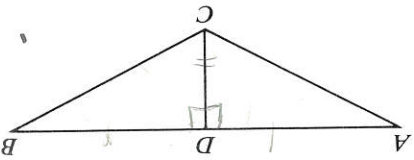
Proof:

1. Supply the reasons.
Given: $\angle P \cong \angle S$;
 O is the midpoint of \overline{PS} .
Prove: O is the midpoint of \overline{RQ} .



Written Exercises

2. Supply the reasons:
 Given: $\overline{CD} \perp \overline{AB}$;
 D is the midpoint of \overline{AB} .
 Prove: $\overline{CA} \cong \overline{CB}$



Proof:

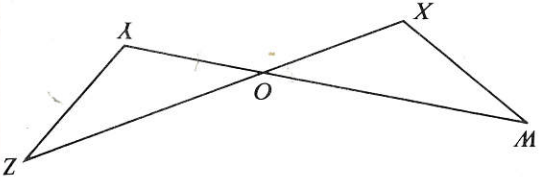
Statements

1. $\overline{CD} \perp \overline{AB}$
2. $\angle CDA \cong \angle CDB$
3. D is the midpoint of \overline{AB} .
4. $\overline{AD} \cong \overline{DB}$
5. $\overline{CD} \cong \overline{CD}$
6. $\triangle CDA \cong \triangle CDB$
7. $\overline{CA} \cong \overline{CB}$

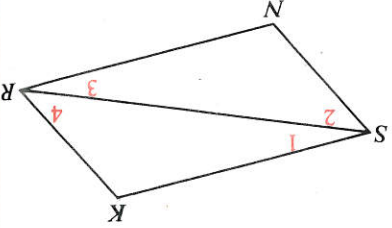
Reasons

Write proofs in two-column form.

3. Given: $\overline{WO} \cong \overline{ZO}$; $\overline{XO} \cong \overline{YO}$
 Prove: $\angle W \cong \angle Z$
4. Given: $\angle X \cong \angle Y$; $\overline{XO} \cong \overline{YO}$
 Prove: $\overline{WO} \cong \overline{ZO}$



5. Given: $\overline{SK} \parallel \overline{NR}$; $\overline{SN} \parallel \overline{KR}$
 Prove: $\overline{SK} \cong \overline{NR}$; $\overline{SN} \cong \overline{KR}$
6. Given: $\overline{SK} \cong \overline{NR}$; $\overline{SN} \cong \overline{KR}$
 Prove: $\overline{SK} \parallel \overline{NR}$; $\overline{SN} \parallel \overline{KR}$

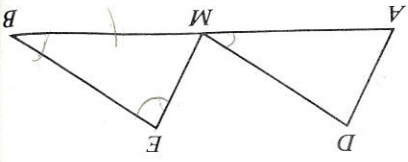


7. Exercise 5 proves that "If the opposite sides of a quadrilateral are parallel, then they are also congruent."

- a. Write the converse of this statement.
- b. Does Exercise 6 prove the converse?

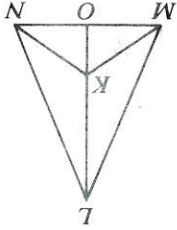
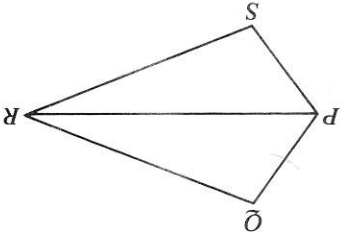
Write proofs in two-column form.

8. Given: $\overline{AD} \parallel \overline{ME}$; $\overline{MD} \parallel \overline{BE}$;
 M is the midpoint of \overline{AB} .
 Prove: $\angle D \cong \angle E$
9. Given: M is the midpoint of \overline{AB} ;
 $\overline{AD} \cong \overline{ME}$; $\overline{AD} \parallel \overline{ME}$.
 Prove: $\overline{DM} \parallel \overline{BE}$

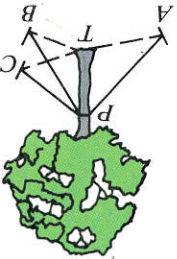


In Exercises 11 and 12, you are given more information than you need. In each exercise state one of the pieces of given information that you do not need for the proof. Then give a two-column proof that does not use that piece of information.

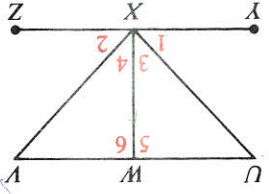
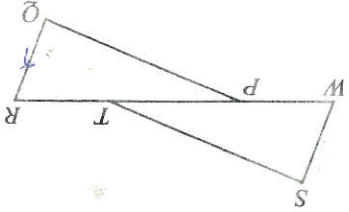
11. Given: $\overline{PQ} \cong \overline{PS}$; $\angle Q \cong \angle S$;
 Prove: $\angle QPR \cong \angle SPR$
12. Given: $\overline{LM} \cong \overline{LN}$; $\overline{KM} \cong \overline{KN}$;
 Prove: \overline{LO} bisects $\angle MLN$.
 \overline{KO} bisects $\angle MKN$.



10. A young tree on level ground is supported at P by three wires of equal length. The wires are staked to the ground at points A , B , and C , which are equally distant from the base of the tree, T . Explain in a paragraph how you can prove that the angles the wires make with the ground are all congruent.



13. Given: $\overline{WS} \cong \overline{RQ}$; $\overline{ST} \cong \overline{QP}$; $\overline{WP} = \overline{RT}$
 Prove: $\overline{WS} \parallel \overline{RQ}$
14. Given: $\overline{WS} \parallel \overline{RQ}$; $\overline{ST} \parallel \overline{PQ}$
 Prove: $\angle S \cong \angle Q$
 (Hint: If you can't find congruent triangles, try another method.)
15. Given: $\overline{WX} \perp \overline{YZ}$; $\angle 1 \cong \angle 2$; $\overline{UX} \cong \overline{VX}$
 Which one(s) of the following statements *must* be true?
 (1) $\overline{XW} \perp \overline{UV}$ (2) $\overline{UV} \parallel \overline{YZ}$ (3) $\overline{VX} \perp \overline{UX}$
 Given: $\overline{WX} \perp \overline{UV}$; $\overline{WX} \perp \overline{YZ}$; $\overline{WU} \cong \overline{WV}$



Prove whatever you can about angles 1, 2, 3, and 4.

17. Given: \overline{PA} and \overline{QB} are perpendicular to plane X ;
 O is the midpoint of \overline{AB} .
 Prove: O is the midpoint of \overline{PQ} .

