

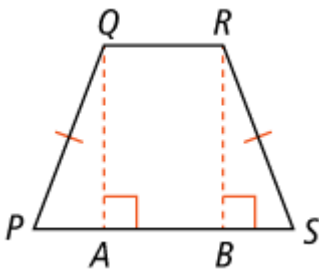
12. **Given:** Kite $WXYZ$

Prove: $\overline{WY} \perp \overline{XZ}$

Statement	Reason
1) $WX = WZ$ and $YX = YZ$	1) Given
2) W and Y are on the perpendicular bisector of \overline{XZ}	2) Converse of Perpendicular Bisector Theorem
3) \overline{WY} is the perpendicular bisector of \overline{XZ}	3) Two points define a unique line.
4) $\overline{WY} \perp \overline{XZ}$	4) Definition of perpendicular bisector

13. **Given:** Isosceles trapezoid $PQRS$

Prove: $\angle QPS \cong \angle RSP$



Given that $\overline{PQ} \cong \overline{SR}$ and $\overline{PS} \parallel \overline{QR}$, draw altitudes \overline{QA} and \overline{RB} . The altitudes are congruent by the definition of the distance between parallel lines. By the HL Theorem, $\triangle PQA \cong \triangle SRB$. By CPCTC, $\angle QPS \cong \angle RSP$.

14. Points B and D are not equidistant from A and C , so \overline{BD} is not the perpendicular bisector of \overline{AC} and $AH \neq HC$.

15. **Given:** Kite $JKLM$, diagonal \overline{KM} , $JK < JM$, $KL < LM$

Prove: $\angle JMK \cong \angle LMK$

Statement	Reason
1) $JKLM$ is a kite.	1) Given
2) $JK < JM$ $KL < LM$	2) Given
3) $\overline{KJ} \cong \overline{KL}$ $\overline{MJ} \cong \overline{ML}$	3) Definition of a kite
4) $\overline{KM} \cong \overline{KM}$	4) Reflexive Property Of Congruence
5) $\triangle JMK \cong \triangle LMK$	5) SSS
6) $\angle JMK \cong \angle LMK$	6) CPCTC

16. 9.2 m; by Theorem 6-3, $\overline{AN} \cong \overline{NC}$, and therefore:

$$\overline{AC} \cong \overline{AN} + \overline{NC}$$

$$\overline{AC} = 2AN$$

$$\overline{AC} = 2(4.6)$$

$$\overline{AC} = 9.2$$

17. $m\angle RUS = 63^\circ$; applying Theorem 6-3, we know that a kite is made of 4 right triangles, each of whose angles add to 180° . It is given that $m\angle SRT = 27^\circ$. Since $\angle TRU \cong \angle SRT$, find $m\angle RUS$.

$$\begin{aligned} m\angle RUS &= 180^\circ - 27^\circ - 90^\circ \\ &= 63^\circ \end{aligned}$$

18. **Given:** Isosceles trapezoid $ABCD$

Prove: $\overline{AC} \cong \overline{DB}$

Statement	Reason
1) $\overline{AB} \cong \overline{DC}$	1) Given
2) $\angle DAB \cong \angle ADC$	2) Theorem 6-4
3) $\overline{AD} \cong \overline{DA}$	3) Reflexive Property Of Congruence
4) $\triangle DAB \cong \triangle ADC$	4) SAS
5) $\overline{AC} \cong \overline{DB}$	5) CPCTC

19. 102° ; by Theorem 6-4, each pair of base angles in an isosceles trapezoid are congruent. The sum of the interior angle measures of a quadrilateral is 360° , and, thus, we solve for $m\angle MNP$.

$$m\angle MNP + m\angle QMN + m\angle PQM + m\angle NPQ = 360^\circ$$

$$2(m\angle MNP) + 2(m\angle PQM) = 360^\circ$$

$$2(m\angle MNP) + 2(78^\circ) = 360^\circ$$

$$2(m\angle MNP) = 204^\circ$$

$$m\angle MNP = 102^\circ$$

20. 30 ft; by the Trapezoid Midsegment Theorem, the length of the midsegment of a trapezoid is half the sum of the lengths of the bases. Solve for XY .

$$DE = \frac{XY+WZ}{2}$$

$$(35) = \frac{XY + \left(\frac{4}{3}XY\right)}{2}$$

$$35 = \frac{7}{6}XY$$

$$30 = XY$$