10. Draw a rectangle and bisect its angles. What name best describes the quadrilateral formed?

Written Exercises

Copy the chart. Then place check marks in the appropriate spaces.

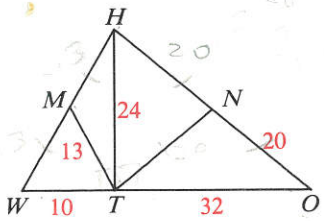
A

	Property	Parallelogram	Rectangle	Rhombus	Square
1.	Opp. sides are $\parallel$.				
2.	Opp. sides are $\cong$.				
3.	Opp. $\measuredangle$s are $\cong$.				
4.	A diag. forms two $\cong$ $\triangle$s.				
5.	Diags. bisect each other.				
6.	Diags. are $\cong$.				
7.	Diags. are $\perp$.				
8.	A diag. bisects two $\measuredangle$s.				
9.	All $\measuredangle$s are rt. $\measuredangle$s.				
10.	All sides are $\cong$.				

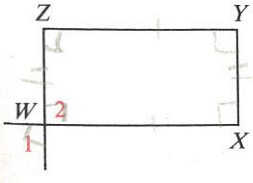
11. Explain why an equiangular quadrilateral must be a rectangle.
12. Explain why a quadrilateral that is a regular polygon must be a square.

$\overline{HT}$ is an altitude of $\triangle HOW$. M and N are the midpoints of $\overline{WH}$ and $\overline{OH}$.

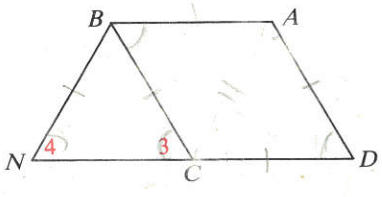
13. $MW =$?
14. $MH =$?
15. $NT =$?
16. $HO =$?



17. Given: $\square WXYZ$; $m\angle 1 = 90$
Prove: $WXYZ$ is a rectangle.

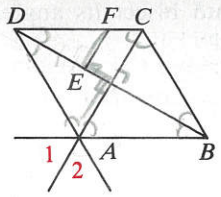


18. Given: $\square ABCD$; $DC = BN$; $\angle 3 \cong \angle 4$
Prove: $ABCD$ is a rhombus.



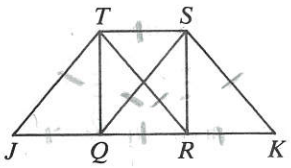
19. Given: Rhombus $ABCD$
Prove: $\angle 1 \cong \angle 2$

20. Given: Rhombus $ABCD$;
$\overline{EF} \parallel \overline{AC}$
Prove: $\overline{EF} \perp \overline{DB}$

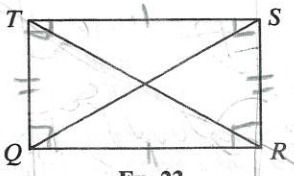


B **21.** Given: Rectangle $QRST$;
$\square RKST$
Prove: $\triangle QSK$ is isos.

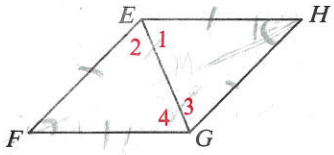
22. Given: Rectangle $QRST$;
$\square RKST$; $\square JQST$
Prove: $\overline{JT} \cong \overline{KS}$



23. Using the figure below, write a complete proof of Theorem 4–9. (*Hint:* Prove $\triangle TQR \cong \triangle SRQ$.)



Ex. 23



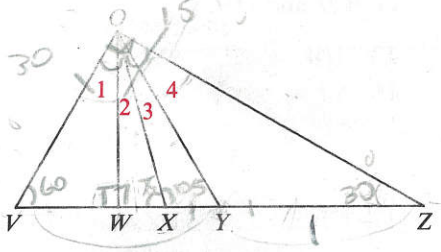
Ex. 24

24. Using the figure above, write a complete proof of Theorem 4–11 for one diagonal of the rhombus. (Note that a proof for the other diagonal would be similar, step-by-step.)

25. Prove: If the diagonals of a parallelogram are perpendicular, then the parallelogram is a rhombus.

26. Prove: If the diagonals of a parallelogram are congruent, then the parallelogram is a rectangle.

In the figure, $m\angle VOZ = 90$.
$\overline{OW}$ is an altitude of $\triangle VOZ$.
$\overline{OX}$ bisects $\angle VOZ$.
$\overline{OY}$ is a median of $\triangle VOZ$.
Find the measures of the four numbered angles.



27. $m\angle Z = 30$ **28.** $m\angle Z = k$

C **29.** **a.** It is known that two sides of a quadrilateral are parallel and that one diagonal bisects an angle. Does that quadrilateral have to be special in other ways? If so, write a proof. If not, draw a convincing figure.
b. Repeat part (a) with stronger conditions: It is known that two sides are parallel and that one diagonal bisects two angles of the quadrilateral.

30. Draw a regular pentagon $ABCDE$. Let X be the intersection of $\overline{AC}$ and $\overline{BD}$. What special kind of quadrilateral is $AXDE$? Write a paragraph proof.