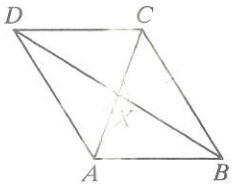
Quad. $ABCD$ is a parallelogram. Name or state the principal theorem or definition that justifies the statement.



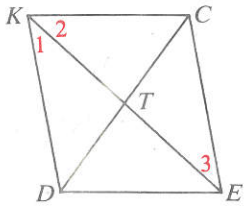
11. $\overline{AD} \parallel \overline{BC}$
12. $\angle ADX \cong \angle CBX$
13. $m\angle ABC = m\angle CDA$
14. $\overline{AD} \cong \overline{BC}$
15. $AX = \frac{1}{2}AC$
16. $DX = BX$
17. Draw a quadrilateral that isn't a parallelogram but does have two 60° angles.
18. What result of this section does each ladder suggest?

Written Exercises

Exercises 1–16 refer to $\square DECK$. Complete each statement in Exercises 1–8.

A

1. If $DE = 10$, $KC =$ ___?___.
2. If $DC = 18$, $DT =$ ___?___.
3. If $m\angle EDK = 100$, $m\angle ECK =$ ___?___.
4. If $m\angle DEC = 75$, $m\angle KDE =$ ___?___.
5. If $m\angle 1 = 30$ and $m\angle 2 = 40$, $m\angle KCE =$ ___?___.
6. If $m\angle 1 = 30$ and $m\angle 2 = 40$, $m\angle 3 =$ ___?___.
7. If $m\angle 3 = 36$ and $m\angle 2 = 44$, $m\angle KDE =$ ___?___.
8. If $DT = 7$ and $KT = 9$, $CD =$ ___?___.



Exs. 1–16

Find the value of x or y.

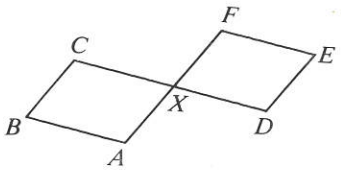
9. $DE = 5x$ and $KC = 3x + 12$
10. $DK = 2x + 5$ and $EC = 47 - 4x$
11. $ET = x + 3$ and $EK = 22$
12. $DT = \frac{1}{2}x$ and $TC = 10$
13. $m\angle KCE = 6y - 20$ and $m\angle EDK = 2y + 80$
14. $m\angle DEC = 80 - y$ and $m\angle DKC = y + 40$
15. $m\angle 1 = y + 10$, $m\angle 2 = 3y$, and $m\angle 3 = \frac{1}{2}y + 15$
16. $m\angle DEC = \frac{y}{4}$ and $m\angle ECK = \frac{y + 60}{2}$

17. Prove Theorem 4–1.

18. Prove Theorem 4–2. (Draw and label a figure. List what is given and what is to be proved.)

19. Prove Theorem 4–3.

20. Given: Quad. $ABCX$ is a $\square$;
quad. $DXFE$ is a $\square$.
Prove: $\angle B \cong \angle E$



Quad. *DECK* is a parallelogram. Complete.

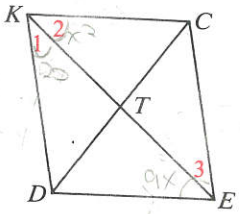
B

21. If $KT = 2x + y$, $DT = x + 2y$, $TE = 12$, and $TC = 9$, then $x =$? and $y =$?.

22. If $DE = x + y$, $EC = 12$, $CK = 2x - y$, and $KD = 3x - 2y$, then $x =$?, $y =$?, and the perimeter of $\square DECK =$?.

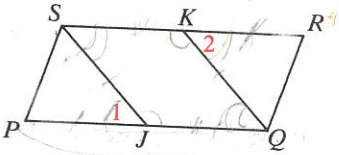
23. If $m\angle 1 = 4x$, $m\angle 2 = 3x$, and $m\angle 3 = x^2 - 60$, then $x =$? and $m\angle CED =$? (numerical answers).

24. If $m\angle 1 = 20$, $m\angle 2 = x^2$, and $m\angle CED = 9x$, then $m\angle 2 =$? or $m\angle 2 =$? (numerical answers).

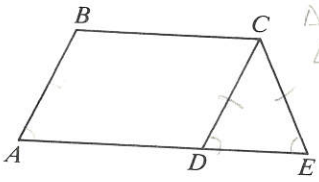


25. Given: $\square PQRS$; $\overline{PJ} \cong \overline{RK}$
Prove: $\overline{SJ} \cong \overline{QK}$

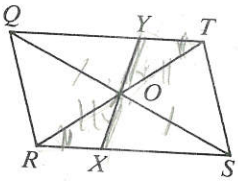
26. Given: $\square JQKS$; $\overline{PJ} \cong \overline{RK}$
Prove: $\angle P \cong \angle R$



27. Given: $ABCD$ is a $\square$; $\overline{CD} \cong \overline{CE}$
Prove: $\angle A \cong \angle E$

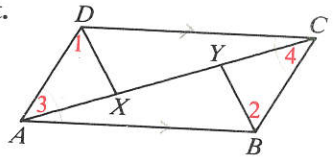


28. Given: $RSTQ$ is a $\square$.
Prove: $\overline{QX} \cong \overline{OY}$



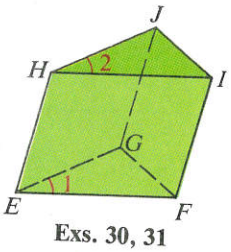
Find something interesting to prove. Then prove it.

29. Given: $\square ABCD$; $\angle 1 \cong \angle 2$
Prove: ?



30. Given: $\square EFIH$; $\square EGJH$; $\angle 1 \cong \angle 2$
Prove: ?

31. Given: $GF \neq JI$ and $GE \neq JH$
   a. Can quadrilaterals $GFIJ$ and $EGJH$ be parallelograms? Explain.
   b. Draw a diagram similar to that shown, but such that $EFIH$ is a parallelogram and it is clear that $GF \neq JI$ and $GE \neq JH$.



Exs. 30, 31