**Using Congruent Triangles Review** **Name:** Mrs. MacDonald

**State the characteristics of the following figures:**

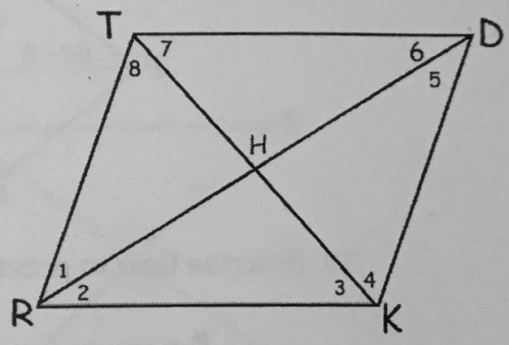
1. Rectangle 2. Kite 3. Square 4. Trapezoid

* look at the Quadrilateral Family Tree

5. Name all the ways for proving a quadrilateral is a parallelogram:

① opposite sides parallel
② opposite sides congruent
③ opposite angles congruent
④ consecutive angles supplementary
⑤ diagonals bisect each other
⑥ one pair parallel + congruent

**Quadrilateral DKRT is a parallelogram.**




7. If TD = 14 and TR = 10, then RK = 14

8. If TK = 18 and RD = 30, then TH = 9

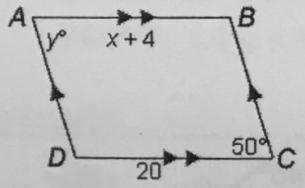
9. If m<3 = 40 and m<2 = 35, then m<RHT = 75°

10. If m<7 = 60 and m<TRK = 50, then m<4 = 70°

11. If $\overline{DR} \perp \overline{TK}$ then parallelogram DKRT must be a rhombus
(rectangle or rhombus)

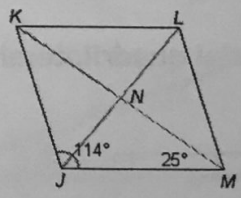
**8.2: Use Properties of Parallelograms**

12. Find the values of x and y.




X = 16
y = 50°

13. Find $m\angle JML$.



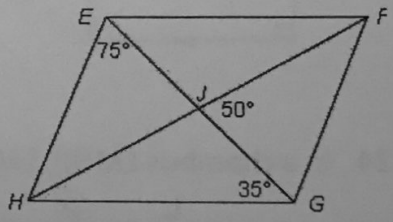

66°

**Use the picture at the right for questions 14-16.**

14. $m\angle EJF$ = 130°

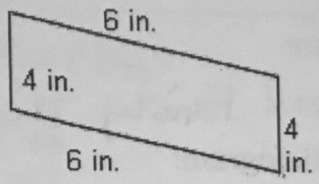
15. $\angle EFJ \cong$ ∠GHJ

16. $\overline{HJ} \cong$ $\overline{JF}$



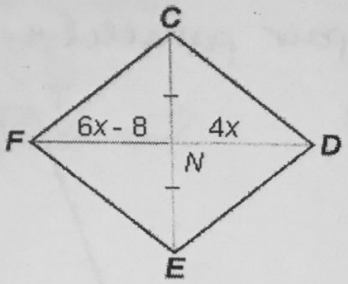
## 8.3: Show that a Quadrilateral is a Parallelogram

17. What theorem can you use to show this quadrilateral is a parallelogram?




both pairs of opposite sides are congruent

18. For what value of x is quadrilateral CDEF a parallelogram?

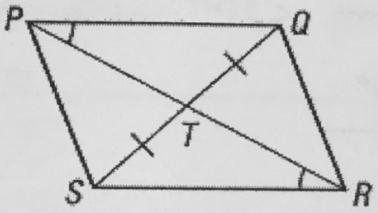



$6x - 8 = 4x$

$2x = 8$

$\boxed{x = 4}$

19. Describe how to prove that quadrilateral PQRS is a parallelogram.




using vertical angles, you can prove $\Delta PQT \cong \Delta RST$ by AAS. Then CPCTC get you one pair of congruent sides & alt. int. angles show those sides are parallel

## 8.4: Properties of Rhombuses, Rectangles, and Squares

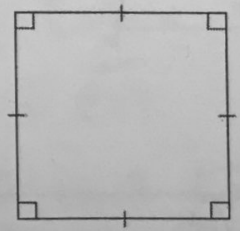
**For any rhombus QRST, decide whether the statement is always, sometimes, or never true.**

20. $\angle Q \cong \angle R$ sometimes

21. $\overline{QT} \cong \overline{RS}$ always

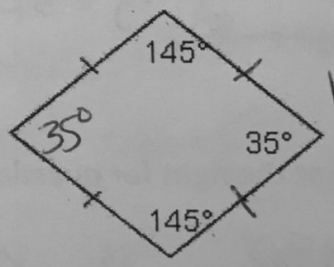
**Classify the special quadrilateral in the given diagram.**

22.



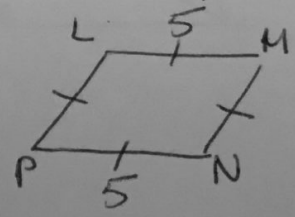
square

23.




rhombus

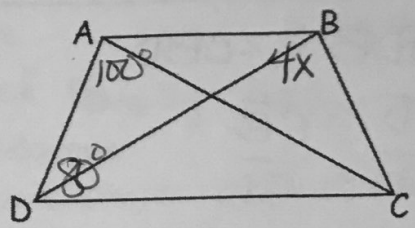
24. In a rhombus LMNP, LM = 5. What is the measure of PN? 5



## 8.5: Use Properties of Trapezoids and Kites

**ABCD is an isosceles trapezoid.**

25. If AD = 3x – 15 and BC = 2x + 20, find x.




$3x-15 = 2x+20$

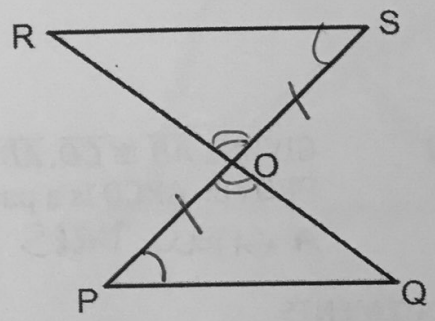
$\boxed{x = 35}$

26. If m<ADC = 80 and m<ABC = 4x, find x.

$4x = 100$

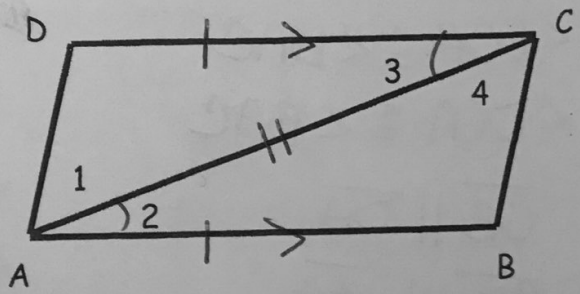
$\boxed{x = 25}$

**Complete the following proofs.**




27. GIVEN: $\angle P \cong \angle S$, O is the midpoint of $\overline{PS}$
PROVE: $\overline{RO} \cong \overline{QO}$

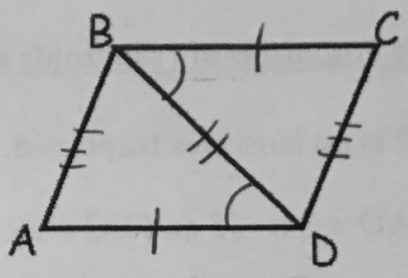
| STATEMENTS | REASONS |
|---|---|
| $\angle P \cong \angle S$ | Given |
| O is midpoint of $\overline{PS}$ | Given |
| $\overline{PO} \cong \overline{SO}$ | Def. of midpoint |
| $\angle SOR \cong \angle POQ$ | vertical angles |
| $\triangle SOR \cong \triangle POQ$ | ASA |
| $\overline{RO} \cong \overline{QO}$ | CPCTC |




28. GIVEN: $\overline{DC} \parallel \overline{AB}$, $\overline{DC} \cong \overline{BA}$
PROVE: $\angle 1 \cong \angle 4$

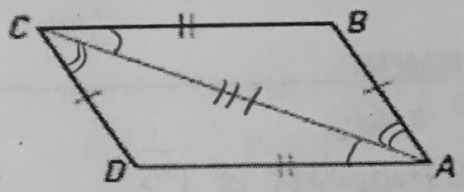
| STATEMENTS | REASONS |
|---|---|
| $\overline{DC} \parallel \overline{AB}$ | Given |
| $\overline{DC} \cong \overline{BA}$ | Given |
| $\overline{AC} \cong \overline{AC}$ | Reflexive |
| $\angle 3 \cong \angle 2$ | Alt. Int. Angles |
| $\triangle DCA \cong \triangle BAC$ | SAS |
| $\angle 1 \cong \angle 4$ | CPCTC |

29. GIVEN: $\angle ADB \cong \angle CBD$, $AD \cong CB$
PROVE: ABCD is a parallelogram




| STATEMENTS | REASONS |
|---|---|
| $\angle ADB \cong \angle CBD$ | Given |
| $\overline{AD} \cong \overline{CB}$ | Given |
| $\overline{BD} \cong \overline{BD}$ | Reflexive |
| $\triangle ADB \cong \triangle CBD$ | SAS |
| $\overline{AB} \cong \overline{CD}$ | CPCTC |
| ABCD is a $\square$ | opposite sides $\cong$ |

30. GIVEN: $\overline{AB} \cong \overline{CD}, \overline{AD} \cong \overline{CB}$
PROVE: ABCD is a parallelogram
* show lines parallel




| STATEMENTS | REASONS |
|---|---|
| $\overline{AB} \cong \overline{CD}$ | Given |
| $\overline{AD} \cong \overline{CB}$ | Given |
| $\overline{CA} \cong \overline{CA}$ | Reflexive |
| $\triangle ABC \cong \triangle CDA$ | SSS |
| $\angle BCA \cong \angle DAC$ | CPCTC |
| $\angle DCA \cong \angle BAC$ | CPCTC |
| $\overline{CB} \parallel \overline{DA}$ | Alt. Int. Angles Converse |
| $\overline{CD} \parallel \overline{BA}$ | Alt. Int. Angles Converse |
| ABCD is a $\square$ | opposite sides parallel |