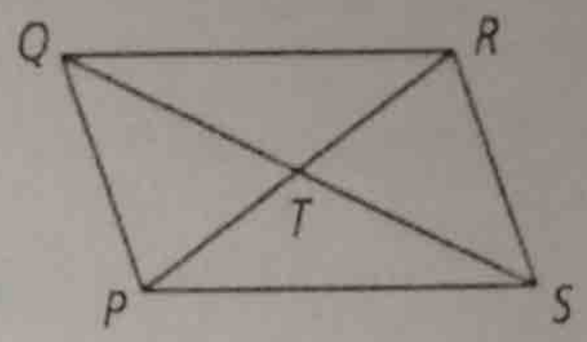
Homework 6.5: Parallelograms & Quadrilaterals

Name: Key!

Math 3

1. Use the diagram below to solve for x and y if the figure is a parallelogram.



a) PT = 2x, QT = y + 12, TR = x + 2, TS = 7y

$2x = x + 2$ $\quad 7y = y + 12$

$x = 2$ $\quad 6y = 12$

$y = 2$

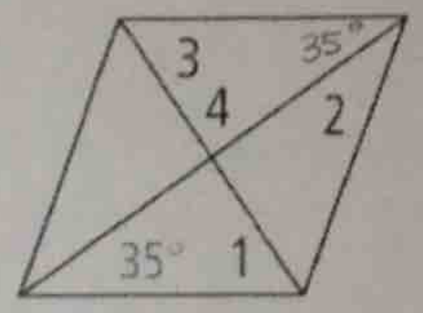
b) PT = y, TR = 4y - 15, QT = x + 6, TS = 4x - 6

$4y - 15 = y$ $\quad 4x - 6 = x + 6$

$3y = 15$ $\quad 3x = 12$

$y = 5$ $\quad x = 4$

2. Find the measure of each angle if the figure is a rhombus.



a) Find the m∠1.

55°

b) Find the m∠2.

35°

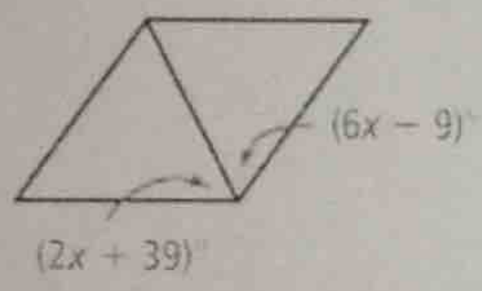
c) Find the m∠3.

55°

d) Find the m∠4.

90°

3. Solve for x if the figure is a rhombus.

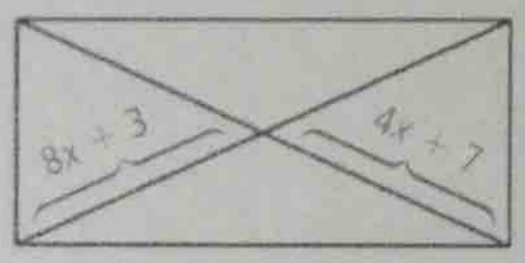


$6x - 9 = 2x + 39$

$4x = 48$

$x = 12$

4. Solve for x if the figure is a rectangle.



$8x + 3 = 4x + 7$

$4x = 4$

$x = 1$

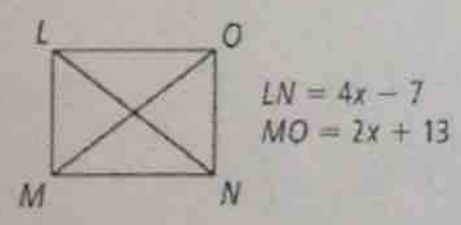
5. What is the length of LN if the figure is a rectangle?

$4x - 7 = 2x + 13$

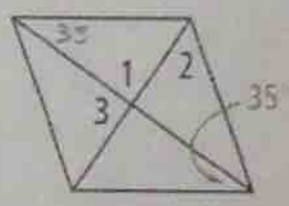
$2x = 20$

$x = 10$

$\overline{LN} = 33$



6. Solve for the missing angle measures if the figure is a rhombus.

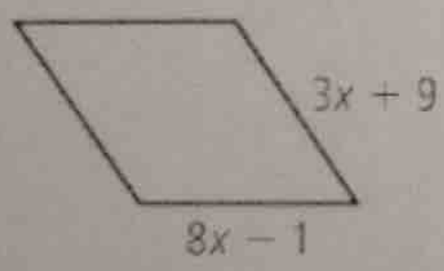


$\angle 1 = 90°$

$\angle 3 = 90°$

$\angle 2 = 55°$

7. What is the length of SW?



$8x - 1 = 3x + 9$

$5x = 10$

$x = 2$

8. Solve for x if the figure is a rhombus.

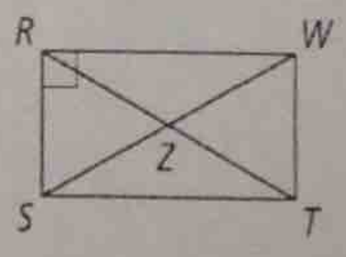
$RZ = 2x + 5$, $SW = 5x - 20$

$2(2x + 5) = 5x - 20$

$4x + 10 = 5x - 20$

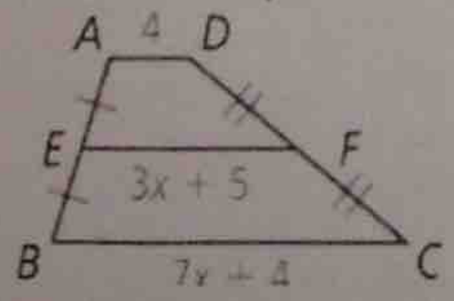
$30 = x$

$\overline{SW} = 130$



Directions: For questions # 9-10, find x and the length of EF.

9.



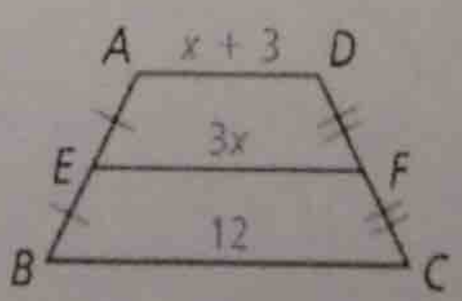
$\frac{7x + 4 + 4}{2} = 3x + 5$

$7x + 8 = 6x + 10$

$x = 2$

$\overline{EF} = 11$

10.



$\frac{x + 3 + 12}{2} = 3x$

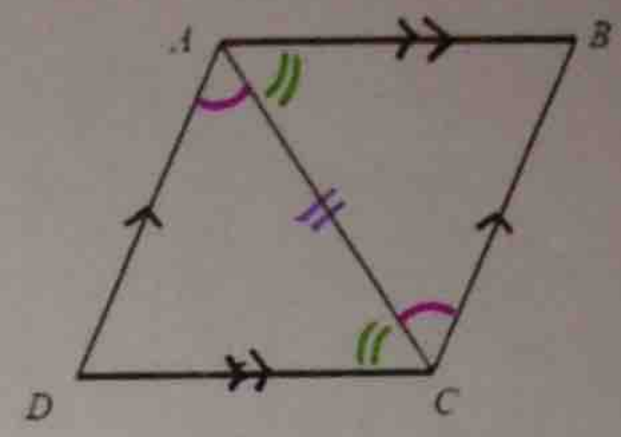
$x + 15 = 6x$

$15 = 5x$

$x = 3$

$\overline{EF} = 9$

Proof #1:



Given: $\square ABCD$

Prove: $\Delta DAC \cong \Delta BCA$

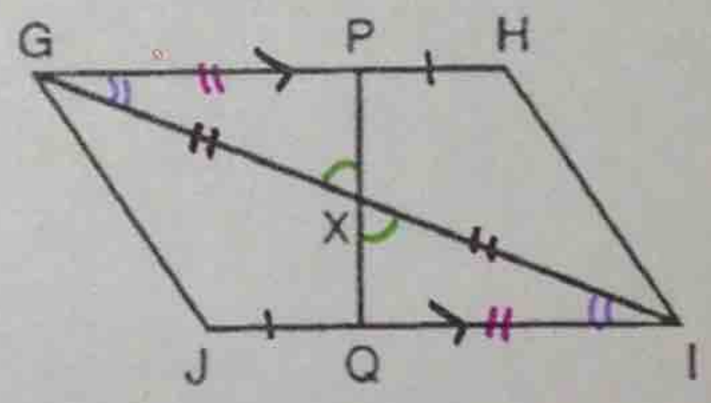
(At most 6 steps! You may not need all 6!!!)

Statements	Reasons
1 $\square ABCD$	1 Given
2 $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \parallel \overline{BC}$	2 Def. of $\square$
3 $\overline{AC} \cong \overline{AC}$	3 Reflexive prop.
4 $\angle DAC \cong \angle BCA$	4 Alt. int. $\angle$s $\cong$
5 $\angle ACD \cong \angle CAB$	5 Alt. int. $\angle$s $\cong$
6 $\Delta DAC \cong BCA$	6 ASA $\Delta \cong$

Proof #2:

Given: $\square GHIJ$
$\overline{HP} \cong \overline{JQ}$

Prove: $\overline{PX} \cong \overline{QX}$



Statements	Reasons
1 $\square GHIJ$, $\overline{HP} \cong \overline{JQ}$	1 Given
2 $\overline{GH} \parallel \overline{JI}$	2 Def. of $\square$
3 $\angle PGX \cong \angle XIQ$	3 Alt. int $\angle$s $\cong$
4 $\angle PXG \cong \angle QXI$	4 vert $\angle$s $\cong$
5 $\overline{GH} \cong \overline{JI}$	5 opp. sides of $\square \cong$
6 $\overline{QI} = \overline{JI} - \overline{JQ}$, $\overline{GP} = \overline{GH} - \overline{PH}$	6 Seg. add. postulate
7 $\overline{GI} = \overline{GP}$	7 Substitution
8 $\Delta GXP \cong \Delta IXQ$	8 AAS $\cong$
9. $\overline{PX} \cong \overline{QX}$	9. CPCTC