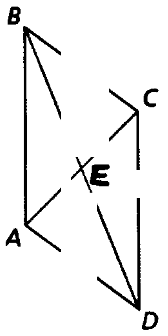
5.3 Practice

1 Use the diagram at the right and your theorems to fill in the □'s.



If $\overline{AB} \cong$ $\boxed{\overline{CD}}$ and $\overline{BC} \cong$ $\boxed{\overline{AD}}$, then $ABCD$ is a ▱.

If $m\angle A + m\angle B =$ $\boxed{180}$ and $m\angle\boxed{C} + m\angle D = 180$, then $ABCD$ is a ▱.

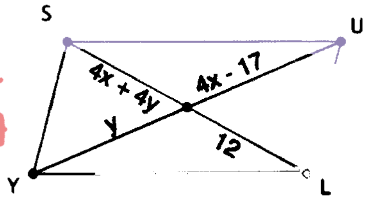
If $\angle A \cong \angle\boxed{C}$ and $\angle\boxed{B} \cong \angle D$, then $ABCD$ is a ▱.

If $\overline{AE} \cong$ $\boxed{\overline{EC}}$ and $\overline{BE} \cong$ $\boxed{\overline{ED}}$, then $ABCD$ is a ▱.

If $\overline{BC} \cong$ $\boxed{\overline{AD}}$ and $\overline{BC} \parallel$ $\boxed{\overline{AD}}$, then $ABCD$ is a ▱.

If $\overline{CD} \cong$ $\boxed{\overline{BA}}$ and $\overline{CD} \parallel$ $\boxed{\overline{BA}}$, then $ABCD$ is a ▱.

2 For what values of x and y is SULY a parallelogram?



$y = 4x - 17$

$4x + 4y = 12$

$4x + 4(4x - 17) = 12$

$4x + 16x - 68 = 12$

$20x - 68 = 12$

$20x = 80$

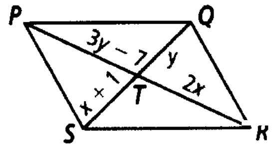
$\boxed{x = 4}$

$y = 4x - 17$

$y = 4(4) - 17$

$\boxed{y = -1}$

3. a. Circle the reason $\overline{PT} \cong \overline{TR}$ and $\overline{ST} \cong \overline{TQ}$.



Opposite sides of a parallelogram are congruent.

Diagonals of a parallelogram bisect each other.

$\overline{PR}$ is the perpendicular bisector of $\overline{QS}$.

b. Cross out the equation(s) that is (are) NOT true:

$3(x+1) - 7 = 2x$ TRUE!

$y = x + 1$ TRUE!

$\cancel{3y - 7 = x +}$

$3y - 7 = 2x$ TRUE

c. Solve for x and y.

$y = x + 1$

$3y - 7 = 2x$

$3(x+1) - 7 = 2x$

$3x + 3 - 7 = 2x$

$3x - 4 = 2x$

$-2x \quad -2x$

$x - 4 = 0$

$x = 4$

$y = x + 1$

$y = 4 + 1$

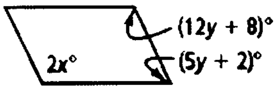
$y = 5$

d PT = 8 ST = 5 PR = 16 SQ= 10

Algebra For what values of x and y must each figure be a parallelogram?

$x = 4y+3$

4.



$5y+2+12y+8=180°$

$17y+10=180$

$17y=170$

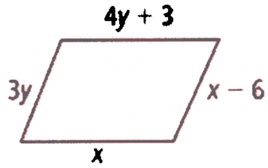
$\boxed{y=10}$

$2x=12(10)+8$

$2x=128$

$\boxed{x=64}$

5.



$3y=x-6$

$3y=4y+3-6$

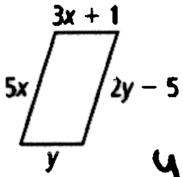
$3y=4y-3$

$\boxed{3=y}$

$x=4(3)+3$

$\boxed{x=15}$

6.



$y=3x+1$

$5x=2y-5$

$5x=2(3x+1)-5$

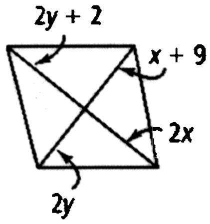
$5x=6x+2-5$

$\boxed{3=x}$

$y=3(3)+1$

$\boxed{y=10}$

7.



$\frac{2x}{2}=\frac{2y}{2}+\frac{2}{2}$

DIV by 2!

$x=y+1$

$2y=x+9$

$2y=(y+1)+9$

$2y=y+10$

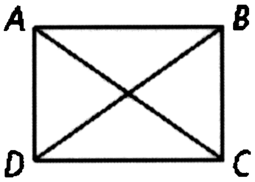
$-y \quad -y$

$\boxed{y=10}$

$x=y+1$

$\boxed{x=11}$

8. Developing Proof Complete the two-column proof. Remember, a rectangle is a parallelogram with four right angles.



Given: ▱$ABCD$, with $\overline{AC} \cong \overline{BD}$

Prove: $ABCD$ is a rectangle

Statements	Reasons
1) ▱$ABCD$, with $\overline{AC} \cong \overline{BD}$	1) Given
2) $\overline{AD} \cong \overline{CB}$	2) Opposite sides of a ▱ are congruent.
3) $\overline{DC} \cong \overline{CD}$	3) SAME
4) $\triangle ADC \cong \triangle BCD$	4) SSS
5) $\angle ADC$ and $\angle BCD$ are supplementary.	5) CONSECUTIVE ∡s of ▱ are suppl
6) $\angle ADC \cong \angle BCD$	6) CPCTC
7) ∡ADC & ∡BCD are RT. ∡s	7) Congruent supplementary angles are right angles.
8) $\angle DAB$ and $\angle CBA$ are right angles.	8) OPPOSITE ∡s of ▱ are ≅
9) ABCD IS A RECT.	9) Definition of a rectangle