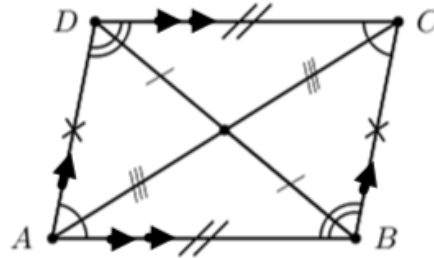Name: _____

Section 9.3
Parallelograms
Notes

Parallelograms: Quadrilateral whose opposite sides are parallel
       Properties: Opposite Sides are Congruent
                    Opposite Angles are Congruent
                    Consecutive Angles are Supplementary
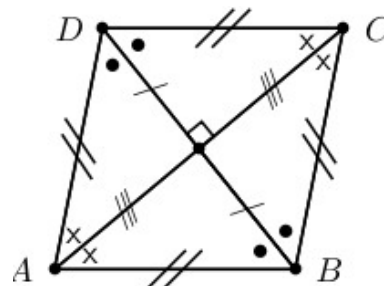   Diagonals bisect each other

Special Types of Parallelograms

| Rectangle | Square | Rhombus |
All angles are $90°$	All sides are $\cong$	All sides are $\cong$
Diagonals are $\cong$	All angles are $90°$	Diagonals are $\perp$
	Diagonals are $\cong$	Diagonals bisect $\angle's$
	Diagonals are $\perp$	
	Diagonals bisect $\angle's$	

A square is a special type of a rectangle and a special type of a rhombus.

Section 9.3 Properties of Quadrilaterals

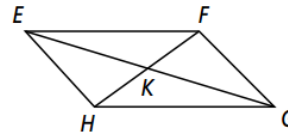Find the value of x and y and z in each parallelogram.

1.

2z+3

y°

z+6

60°

x°

2.

27°

y+3

x°

7

z°
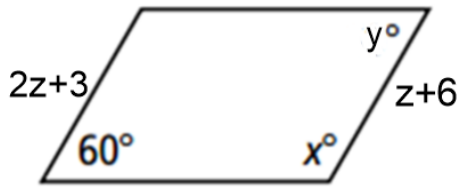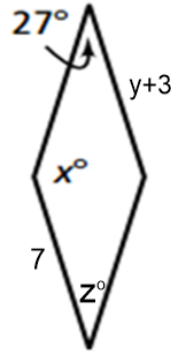
Complete this two column proof:

Given: ▱EFGH, with diagonals $\overline{EG}$ and $\overline{HF}$

Prove: $\triangle EFK \cong \triangle GHK$

Statements	Reason
3.	Given
4.	The diagonals of a parallelogram bisect each other.
$\overline{EF} \cong \overline{GH}$	6.
5.	7.

Find the values for x and y in ▱ABCD.

8. AE $= x + 5$, EC $=$ y, DE $=$ 2x+3, EB$= y + 2$
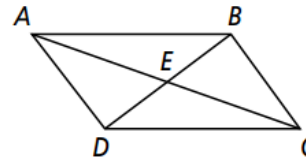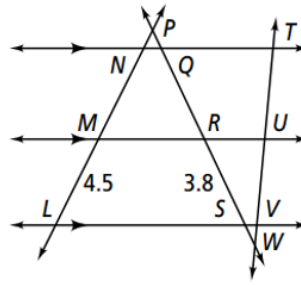

9. AE $= 3x$, EC $= 2y - 2$, DE $= 5x$, EB $= 2y + 2$

In the figure, TU = UV. Find each length.
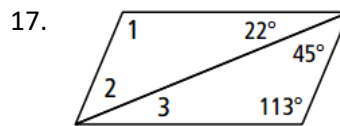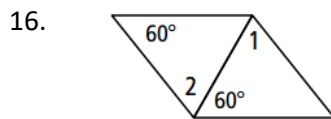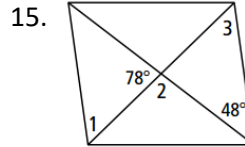 10. NM   11. QR

  12. LN   13. QS

Find the measures of the numbered angles for each parallelogram.

14. 75°

15. 78° 48° 3 2 1

16. 60° 60° 1 2

17. 1 2 22° 45° 113° 3
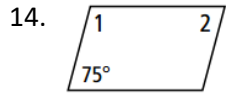
Decide whether the parallelogram is a rhombus, a rectangle, or a square.
18.   19.   20.   21.
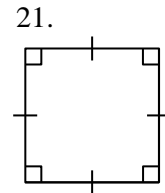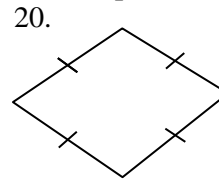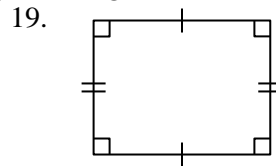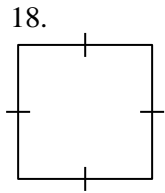
Find the measures of the numbered angles in each rhombus.
22. Q R 104° 3 4 1 2 P S

23. 1 2 3 4 58°

24. 2 1 3 50°

25. 3 2 1 60°
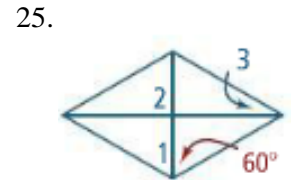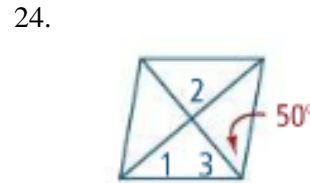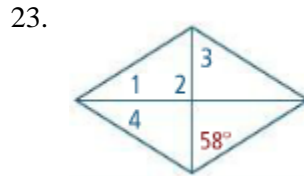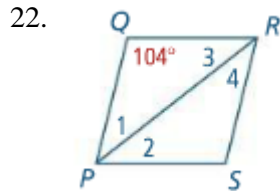
LMNO is a rectangle. Find the value of x and the length of each diagonal.
  26. $LN = 5x-8$ and $MO = 2x+1$
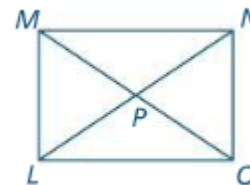
  27. $LN = 3x + 1$ and $MO = 8x - 4$

  28. ABCD is a square. a) Find the measure of angle 2.

      b) Find the measure of angle 1.

      c) Find the length of side AB.

      d) find the length of DB.