Geo – Unit 7 – Day 1 – Introduction of Quadrilaterals HOMEFUN

For 1 – 3, determine if the following shapes are polygons identify if the following are polygons. If so, name them (Type of Polygon and Convex/Concave).

For 4 – 5, Determine if the following polygons are regular polygons, if so name them.

1.

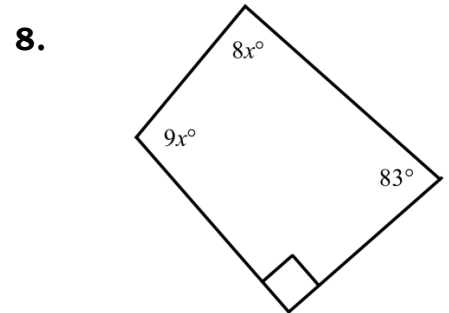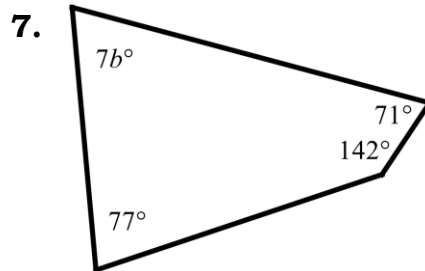**2.**

3.

4.

5.
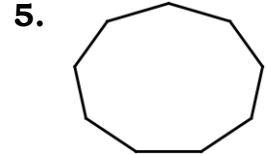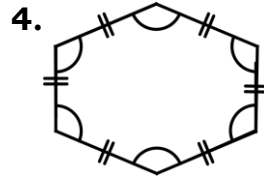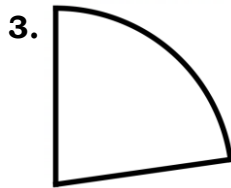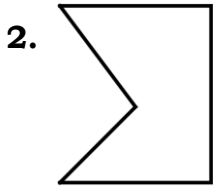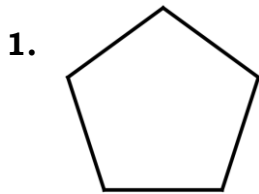
Yes / No   Yes / No   Yes / No   Regular?   Regular?

Concave / Convex   Concave / Convex   Concave / Convex

_____   _____   _____   _____   _____

For 6 – 8, solve for the following variables.

6.

$126°$

$x°$

7.

$7b°$

$71°$

$142°$

$77°$

8.

$8x°$

$9x°$

$83°$
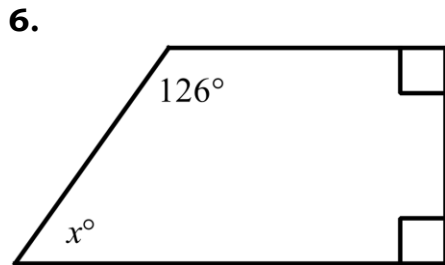
For 9 – 10, find the measure of the desired angles.

9. $m\angle B$

B

$(2x + 5)°$

A $60°$

$x°$ C

$(2x + 5)°$

D

10. $m\angle Q$

R   S

$120°$

$120°$

Q   T
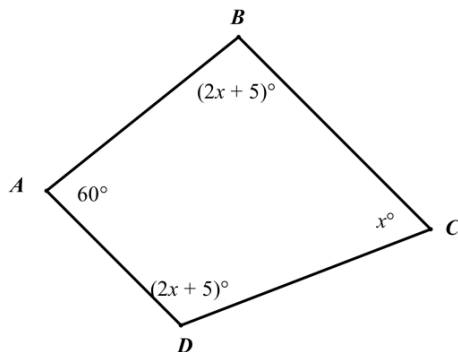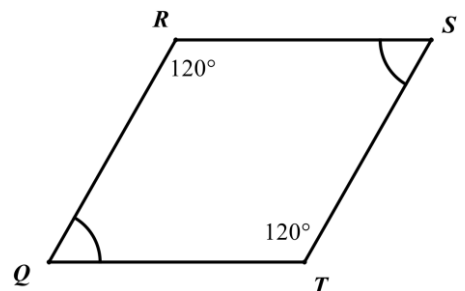
11. Three of the four angle measures in a quadrilateral are 90, 125, and 25. What is the measure of the 4th angle?

12. Multiple Choice: Find the measure angle T in quadrilateral RSTU if $m\angle R = x$, $m\angle s = x + 10$, $m\angle T = x + 30$, and $m\angle U = 50$.

    a) $m\angle T = 90°$
    b) $m\angle T = 100°$
    c) $m\angle T = 120°$
    d) Not Enough Information

13. Explain if it is possible to have a quadrilateral with four acute angles. If so draw a picture; if not, explain why not.
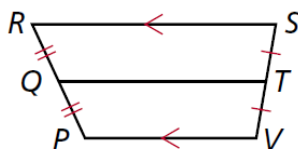
Mixed Review: Solve the following by factoring

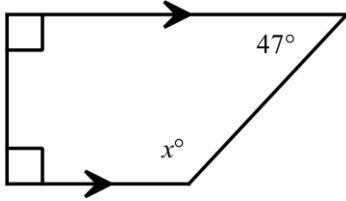**14.** $x^2 + 2x - 15 = 0$ **15.** $x^2 - 6x = 55$

Geo – Unit 7 – Day 2 – Trapezoids and Kites

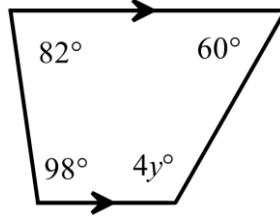**1.** In the trapezoid PRSV, name the bases, legs, and midsegment.
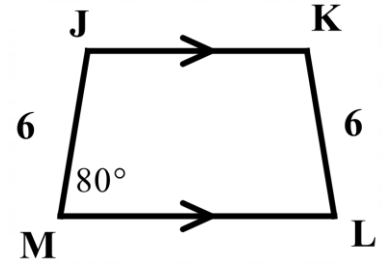
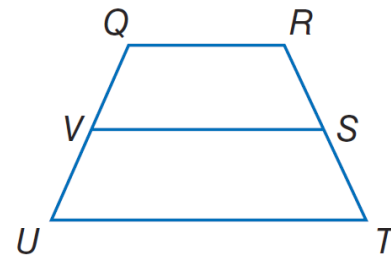**For 2 – 6, find the indicated measure.**

3. Find x

47°

$x°$

4. Find y

82°   60°

98° $4y°$

5. $m\angle k$

J   K

6   6

80°

M   L

For 7 – 9, Trapezoid QRTU, V and S are midpoints of the legs.

7. If $QR = 12$, and $UT = 22$, find VS.

8. If $VS = 9$ and $UT = 12$, find QR.

9. If $RQ = 5$, and $VS = 11$, find UT.

Q   R

V   S

U   T

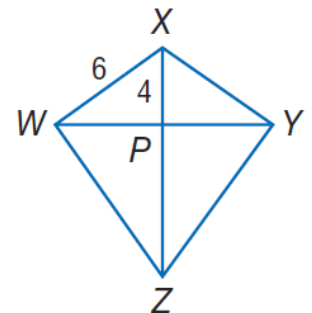**Given Kite WXYZ, find each measure.**

10. find $x=$_____

X

$x°$

W 99°

36°   Y

$y°$

Z

11. $YX =$ _____

W

Z   X

5

8

Y

12. $WP =$ _____

X

6

4

W   Y

P

Z

14. $m < Z =$ _____

Y

120°

X   Z

W
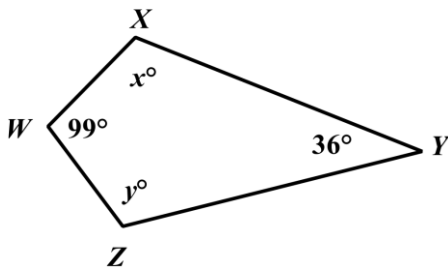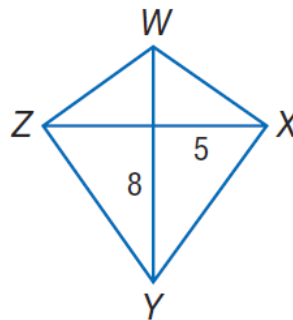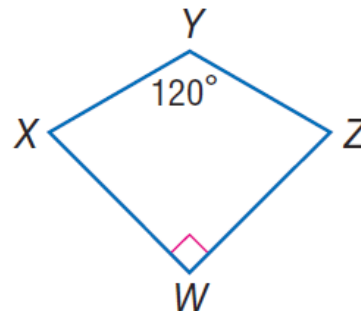
In Kite WXYZ, $m < WXY = 104$, **and** $m < VYZ = 49$. **Find the following.**
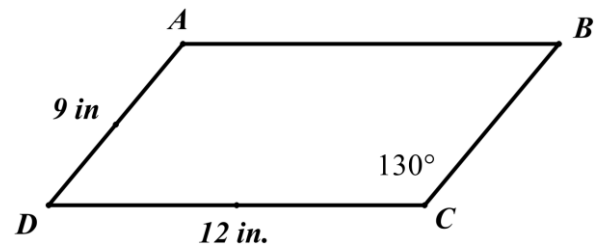
15. $m\angle VXY =$ _____   **16.** $m\angle WZY =$ _____
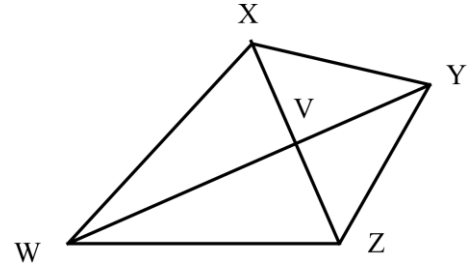
Geo – Unit 7 – Day 3 – Parallelograms

For 1 – 4, find the following

1. $m\angle A =$ _____   **2.** $m\angle D =$ _____

3. $AB =$ _____   **4.** $BC =$ _____

9 in

130°

12 in.

For 5 – 6, given that quadrilateral WXYZ is a parallelogram. Find the following information

5. $m\angle Z =$ _____   **6.** $m\angle W =$ _____

$3x°$

$(5x - 20)°$
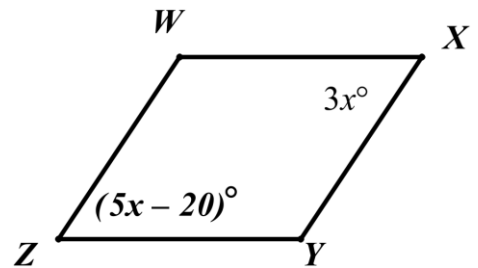
For 7 – 8, the quadrilateral at the right is a parallelogram. Find the following.

7. $BC =$ _____   **8.** $CD =$ _____

$y - 1$

$2y + 10$

$3y$

$2x + 1$

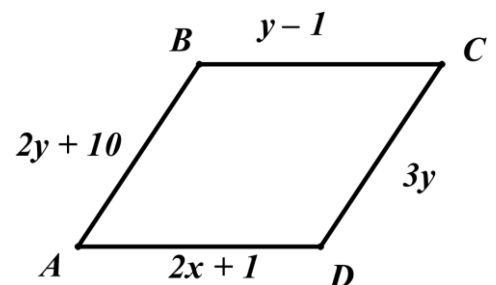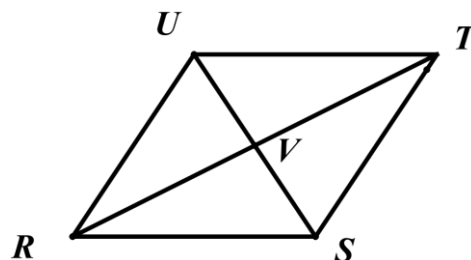**Given that quadrilateral RSTU is a parallelogram where** $UV = 3z - 4, VS = z + 5,$
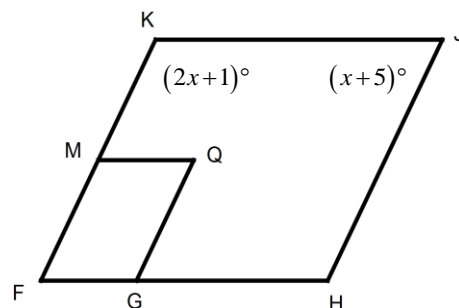$RV = 2y - 5, and\ VT = y + 4$. **Find the following information**

9. $UV =$ _____

10. $TR =$ _____

Given parallelograms FMQG and FKJH, find the following.

**12.** $m\angle J =$ _____

13. $m\angle Q =$ _____

14. For the following, given Parallelogram ABCD determine if the following statements are always true, sometimes true, or never true.

Circle one for Each Part			
A) $\overline{AB} \cong \overline{BC}$	Always	Sometimes	Never
B) $\overline{AB} \cong \overline{DC}$	Always	Sometimes	Never
C) $\overline{AM} \cong \overline{BC}$	Always	Sometimes	Never
D) M is a midpoint of $\overline{AC}$	Always	Sometimes	Never
E) $m\angle ADC > 90^\Box$	Always	Sometimes	Never
F) $\angle BAD$ is supp. to $\angle ADC$	Always	Sometimes	Never
G) $m\angle ABC = m\angle ADC$	Always	Sometimes	Never
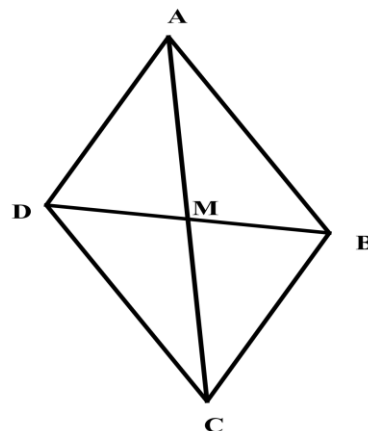
15. Given *MNPQ* is a parallelogram, which of the following statements must be true? Select **all** that apply.
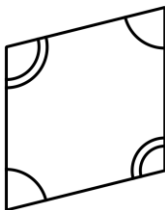
f) $\angle MNP \cong \angle PQM$
g) $\angle MRQ \cong \angle NRP$
h) $\overline{MR} \cong \overline{PR}$
i) $\overline{MQ} \cong \overline{MN}$
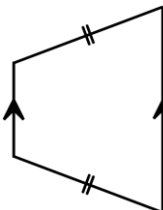**j)** $\overline{MP} \cong \overline{QN}$
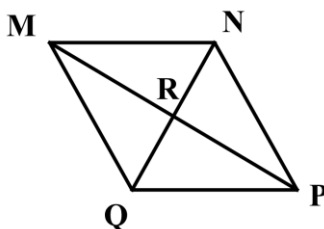
Geo – Unit 7 – Day 4 – Proving Quads Parallelograms

For 1 – 9, write a statement stating if the following quadrilaterals can be proven parallelograms.
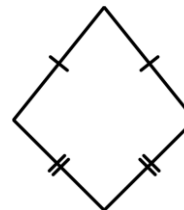
1.

_____
_____
_____

2.

_____
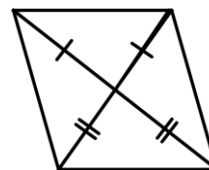_____
_____

3.

_____
_____
_____

4.

_____
_____
_____

5.

_____
_____
_____

6.

_____
_____
_____

7.

50°   130°

_____
_____
_____

8.

_____
_____
_____

9.

4.5 in

4 in   4 in

4.5 in

_____
_____
_____
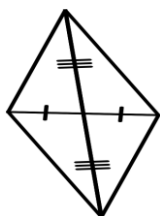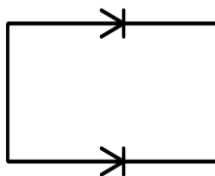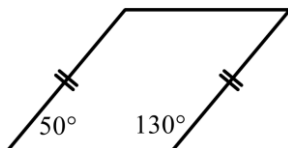
For 10 – 14, find the values of the variables so that ABCD must be a parallelogram.

10.

11. A — $4x - 22$ — B; $3(y - 6)$; $2y + 4$; D; $3x + 11$; C

12. B; A $(3x + 10)°$; $(4x - 10)°$ C; $11y°$; D

13. A — D; $3x°$; $18y°$; B — C

14. A — B; $(8x - 16)°$; D $y°$; $(x^2 - 49)°$; C
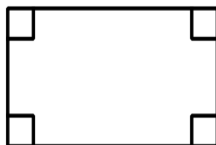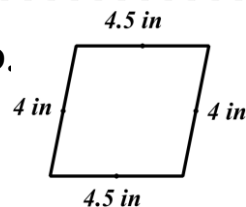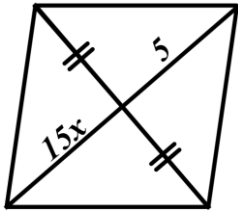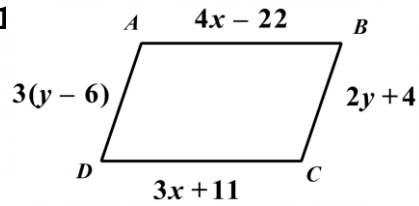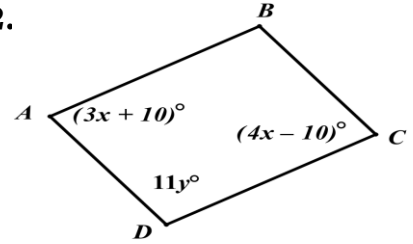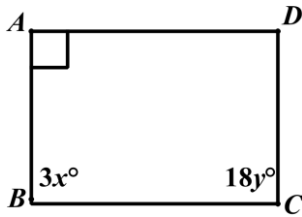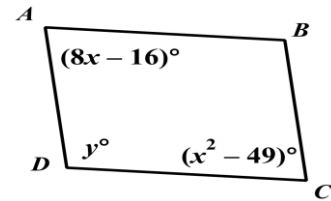
15. What is the $m\angle H$ that would make EFGH a parallelogram?

H

A. $m\angle H = 7°$

B. $m\angle H = 49°$

E; $(7x)°$; G

C. $m\angle H = 128°$

$(19x - 2)°$

D. $m\angle H = 131°$

F
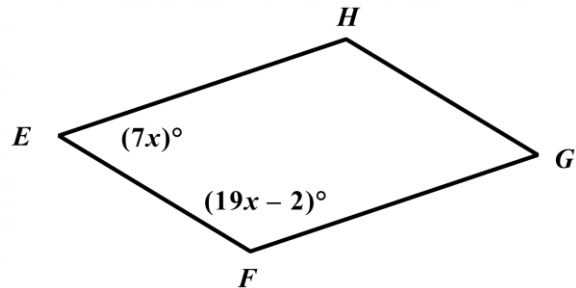
Geo – Unit 7 – Day 1 – 4 Review

1. Fill out the chart for each quadrilateral. Place an _x_ in the box if it applies to that shape.

Description	Parallelogram	Trapezoid	Isosceles Trapezoid	Kite	Quadrilateral
Opposite Sides parallel					
Opposite Sides Congruent					
Opposite Corner Angles Congruent					
Consecutive Corners are Supplementary					
Diagonals bisect each other					
Diagonals are Congruent					
Diagonals are perpendicular to each other					
Only One pair of sides are parallel					
Base angles are congruent					
Consecutive Sides are Congruent					
The internal angles add up to 360 degrees.					

2. State the five characteristics of a parallelogram on the following diagrams.

3. Solve for x

$70°$

$4x°$

$96°$ $90°$
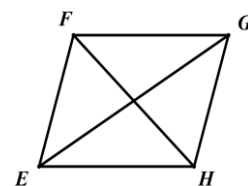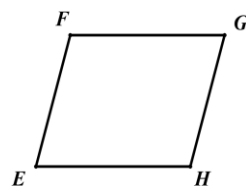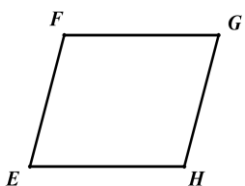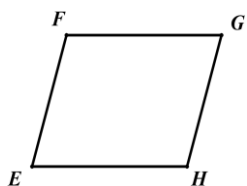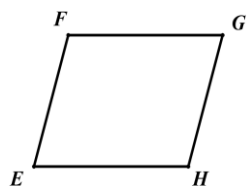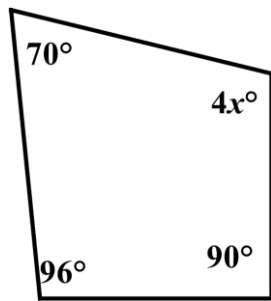
4. Given Kite ABCD
Solve for x

B

$x°$

A $37°$ C

$y°$

D
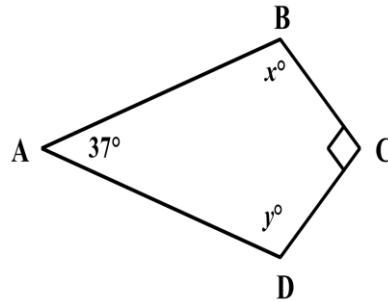
5. Given Trapezoid
Find $m\angle R$

R

$y°$

Q

$114°$

$x°$ $(x+10)°$

P   S

6. Solve for y

X

$x°$

W $99°$

$36°$ Y

$y°$

Z

7. Find $m\angle J$

J   K

6 6

$80°$

M   L

8. Solve for x

$47°$
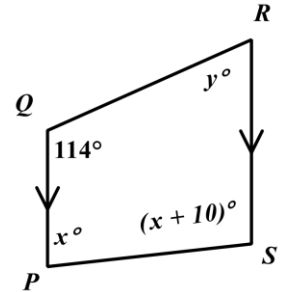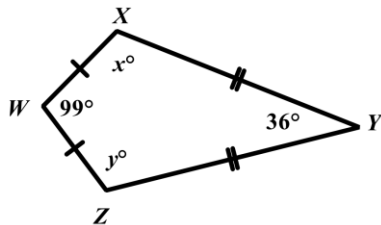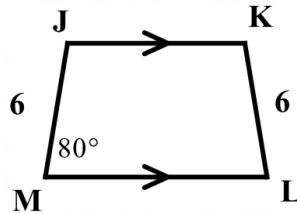
$x°$
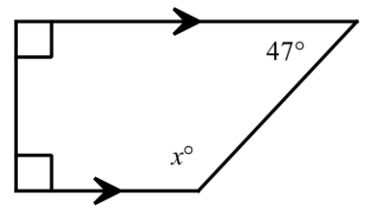
Solve for the following, assume the following are parallelograms

9. Solve for x

$2x - 3$

$x + 4$

10. Solve for x & y

$4x°$

$y°$ $128°$

11. Solve for x & y

$4x - 2$ $4y - 4$

$4x$ $y + 3$

12. $BE = x^2 - 48$, $DE = 2x$ **Find BD.**

B   C

E

16

A   D

13. Find ST

R $3f - 6$ S

$117°$

$d + f$

$(5d - 2)°$
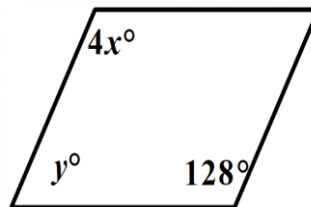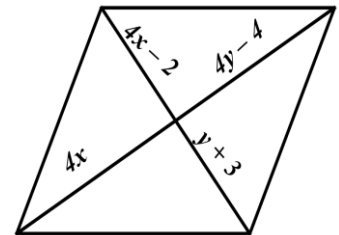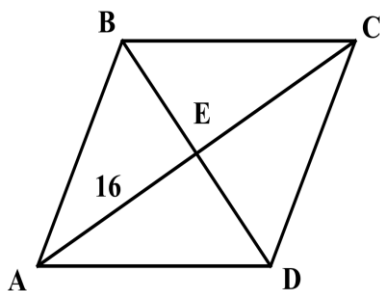
U $2f + 8$ T
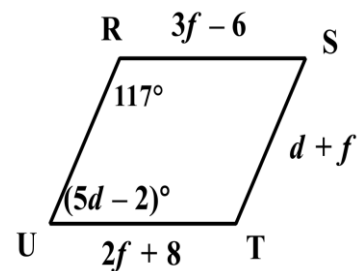
In the parallelogram, CG = 4.5ft, and BD = 12ft. Find the following.

14. $FD =$ _____

15. $BF =$ _____

16. $BG =$ _____

17. $CF =$ _____

18. $m\angle CBF =$ _____

19. $m\angle BCD =$ _____
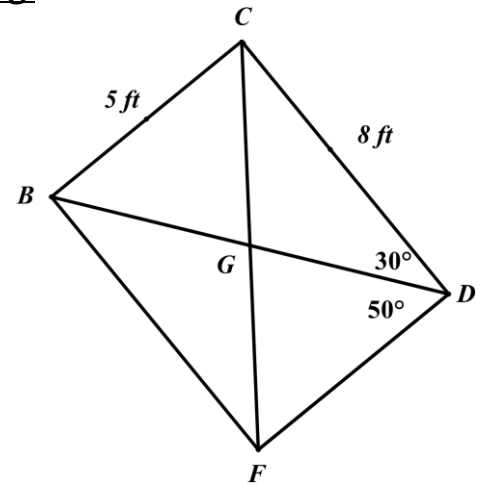
For 19 – 24, write a statement stating if the following quadrilaterals can be proven parallelograms.

20.

_____

_____

_____

21.

_____

_____

_____

22.
104°   76°
76°   104°

_____

_____

_____

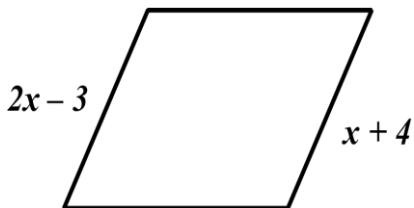**23.**

_____

_____

_____

24.

_____

_____

_____

25.

_____

_____

_____
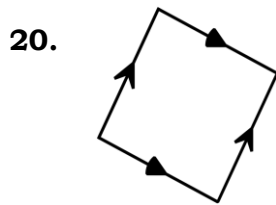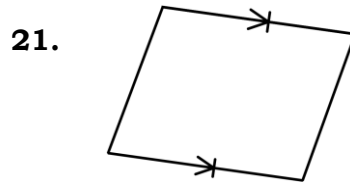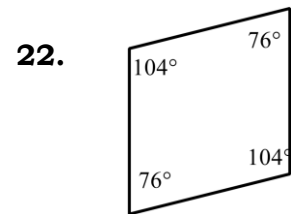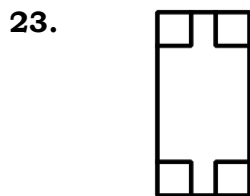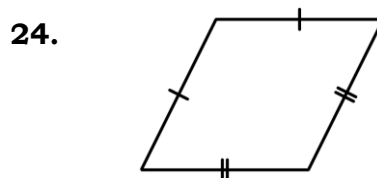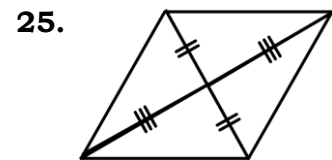
For 26 – 27, given the trapezoid below with midpoints V and S. Find the following.

26. If $QR = 8$, and $UT = 28$, find VS.

27. If $QR = 1$, and $UT = 7$, find VS.
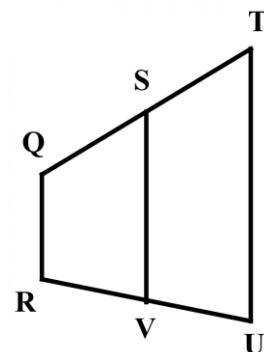
28. A wooden frame has screws at *A, B, C,* and *D* so that the sides of it can be pressed to change the angles occurring at each vertex. $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{CD}$, even when the angles change. Why is the frame always a parallelogram?
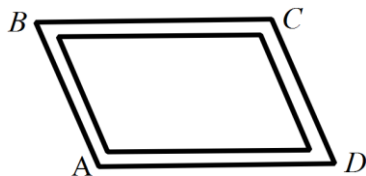
A. The angles always stay the same, so $ABCD$ is a parallelogram.

B. All sides are congruent, so $ABCD$ is a parallelogram.

C. One pair of opposite sides is congruent and parallel, so $ABCD$ is a parallelogram.

D. One pair of opposite sides is congruent, so $ABCD$ is a parallelogram.

29. What is the measure of FJ will make $FGHJ$ a Parallelogram, given the following:

$$FG = x + 7$$
$$GH = 3x - 8$$
$$m\angle F = 40°$$
$$m\angle H = (3x + 10)°$$
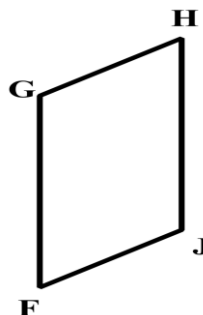
A. $FJ = 10$

B. $FJ = 17$

C. $FJ = 22$

D. $FJ = 42$

30. Which of the following is NOT always true of Parallelogram $ABCD$?

A. $\overline{AB} \cong \overline{BC}, \overline{DC} \cong \overline{BC}$

B. $\overline{AB} \cong \overline{DC}, \overline{BC} \cong \overline{AD}$

C. $m\angle A + m\angle B = 180°$

D. $AB + BC = AD + DC$
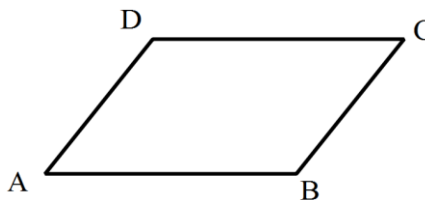
<u>Given rectangle *ABCD*, find the following.</u>

1. $m\angle D =$ _____

2. $m\angle ACB =$ _____

3. $BC =$ _____

4. $DC =$ _____

5. $AC =$ _____
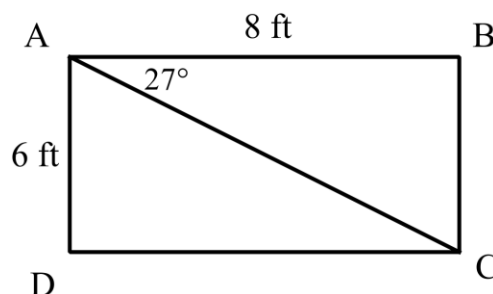
<u>Given rhombus *ABCD*, find the following.</u>

6. $AD =$ _____

7. $CD =$ _____

8. $m\angle BAE =$ _____

9. $m\angle CED =$ _____

10. $m\angle EDC =$ _____
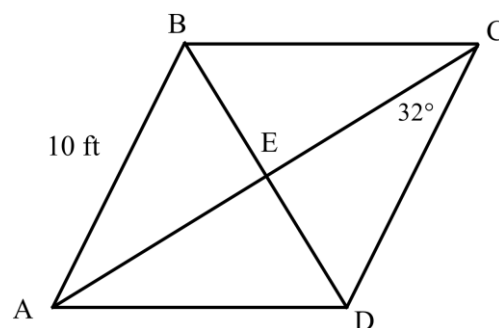
11. Find the value of x and y in the following rectangle.

x $(8x - 10)°$ $(y^2 - 3y$

$(2x)°$
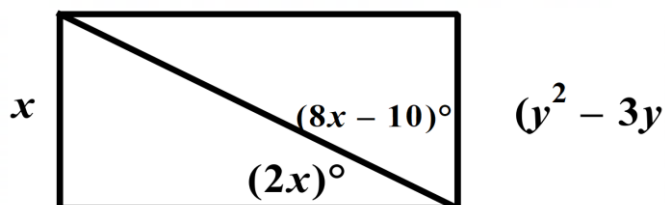
12. In rectangle ABCD, $m\angle EAB = 4x + 6$, $m\angle DEC = 10 - 11y$, and $m\angle EBC = 60$. Find the values of x and y.
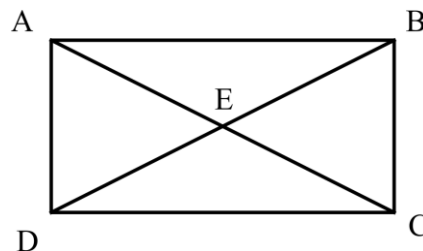
13. *JKLM* is a rhombus. If $m\angle JML = 70°$, what is the value of $m\angle JKM$?

    A. $m\angle JKM = 35°$

    B. $m\angle JKM = 70°$

    C. $m\angle JKM = 55°$

    D. $m\angle JKM = 110°$
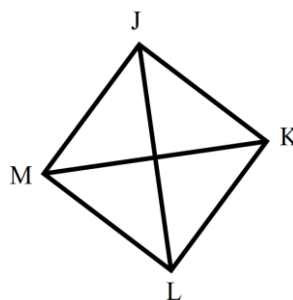
14. Based on the figure below, which statements are true or false?

Select <u>all</u> that are true.

    f) $x = 5$
    g) $x = 8$
    h) $6x - 4 = 9x + 3$
    i) $9x + 3 = 10x - 2$
    j) The figure is a parallelogram
    k) This figure is a rectangle.
    l) This figure is a rhombus.
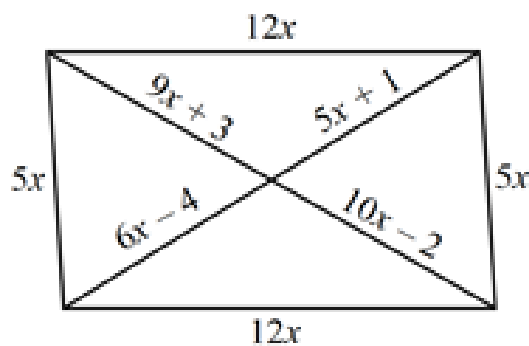
Geo – Unit 7 – Day 7 – Squares

Given Square *ABCD*, find the following.

1. $AD =$ _____   **2.** $CD =$ _____

3. $BD =$ _____   **4.** $m\angle DCB =$ _____

5. $m\angle BAD =$ _____   **6.** $m\angle CBD =$ _____
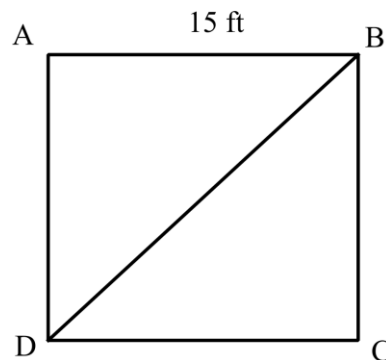
WXYZ is a square. If $WT = 3$, find each measure.

6. $XZ =$ _____   **7.** $XY =$ _____

8. $m\angle WTZ =$ _____   **9.** $m\angle WYX =$ _____
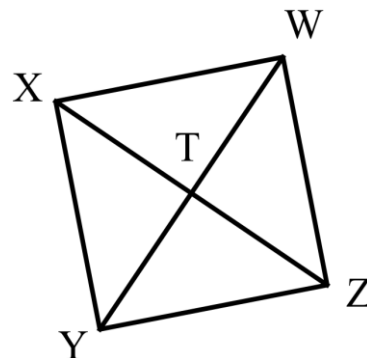
9. The quadrilateral at the right is a <u>square</u>. Solve for x and y.

$x =$ _____ $y =$ _____
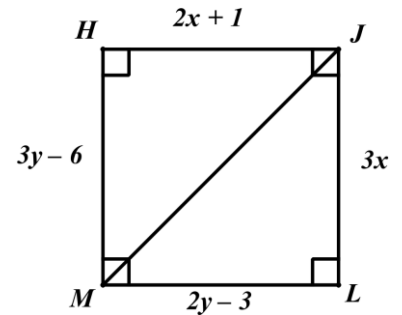
Given that ABCD is a Square, find the following.

10. $m\angle CAB =$ _____

11. $x =$ _____

12. $DC =$ _____
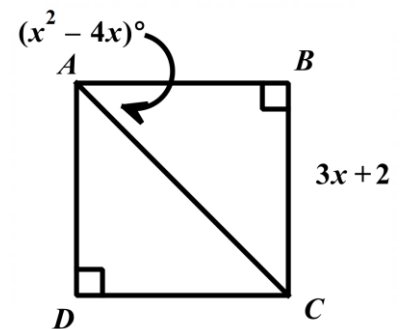
13. Which statement is true?

    A. All quadrilaterals are rectangles.

    B. All rectangles are parallelograms.

    C. All parallelograms are rectangles.

    D. All quadrilaterals are squares.

Geo – Unit 7 – Day 8 – Quad Family Tree

Place an *x* in each box if that category applies to that shape.

Property	Parallelogram	Rectangle	Rhombus	Square	Quadrilateral	Trapezoid	Isosceles Trapezoid	Kite
Both pairs of opp sides are ∥								
Exactly 1 pair of opp sides are ∥								
Diagonals are ⊥								
Diagonals are ≅								
Diagonals bisect each other								
Interior Angles add up to 360 degrees.								
Both pairs of opp sides are ≅								
All sides are ≅								
Both pairs of opp angles are ≅								
Exactly 1 pair of opp angles are ≅								
All angles are ≅								
All ∠'s ≅								
Base ∠'s ≅								
Is considered a parallelogram								

Geo – Unit 7 – Day 9 – Quad Family Tree

Determine whether the given vertices represent a parallelogram, rectangle, rhombus, square, trapezoid, isosceles trapezoid or kite. Then explain your reasoning.

1. $A(0,2), B(2,4), C(4,2), D(2,0)$

2. $A(-1,1), B(2,1), C(3,-2), D(2,-2)$
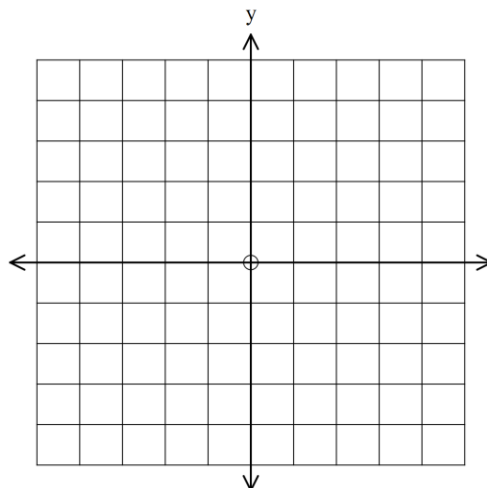
Slope for Each Side

$AB=$_____

$AC=$_____

$CD=$_____

$BD=$_____

Slope for Each Side

$AB=$_____

$AC=$_____

$CD=$_____

$BD=$_____

Cross them off as you go....

K T IT P R R S

Cross them off as you go....
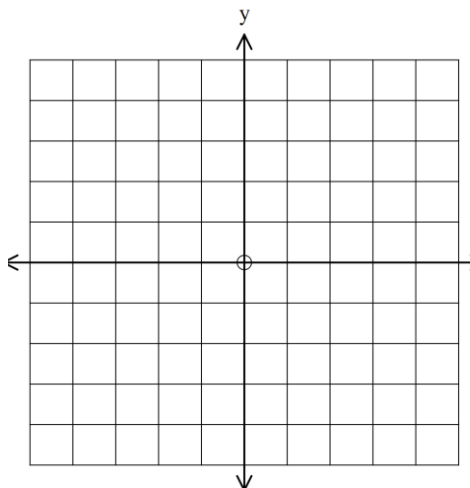
K T IT P R R S

FINAL ANSWER: _____

FINAL ANSWER: _____

Work must be shown on graph paper.

3. $D(-2,1), E(-1,3),\ F(3,1), G(2,-1)$
4. $L(-2,-1), M(0,2), N(2,-1), P(0,-4)$
5. $S(-3,0), T(-1,3),\ U(5,-1), V(3,-4)$
6. $A(-1,4), B(3,2), C(1,-2), D(-3,0)$
7. $A(3,5), B(3,1), C(-1,1), D(-1,5)$
8. $D(-5,12), E(5,12), F(-1,4), G(-11,4)$
9. $W(-6,-1), X(4,-6), Y(2,5), Z(-8,10)$
10. $A(2,-4), B(-6,-8), C(-10,2), D(-2,6)$
11. $R(-9,1), S(2,3), T(12,-2), V(1,-4)$
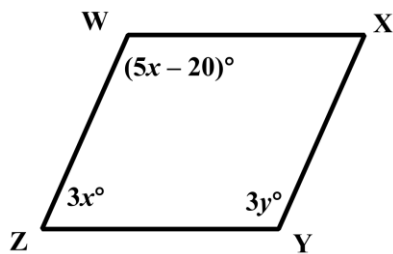**12.** $A(1,3), B(7,-3), C(1,-9), D(-5,-3)$
13. $W(-4,-5), X(1,-5), Y(-2,-1), Z(-7,-1)$
14.   The vertices of an isosceles trapezoid are $A(-2,2), B(2,2), C(4,-1), D(-4,-1)$. Verify that the diagonals are congruent.
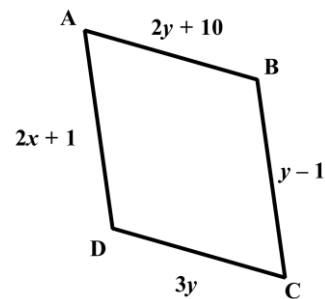**15.**   Square RSTU has vertices of $R(-3,-1), T(-1,2), S(2,0),$ Find the coordinates of the missing vertex U.

Geo – Unit 7 – Unit Review

1. What value for y would make quadrilateral WXYZ a <u>parallelogram</u>?

W
X
$(5x - 20)°$
$3x°$
$3y°$
Z
Y

2. The quadrilateral below is a <u>parallelogram</u>. Solve for x and y.

A
$2y + 10$
B
$2x + 1$
$y - 1$
D
$3y$
C

3. Given the rhombus, find DE.

$\left(\frac{3}{2}\right)y$
D
C
$y + 2$
E
$2z - y$
$z + 1$
F
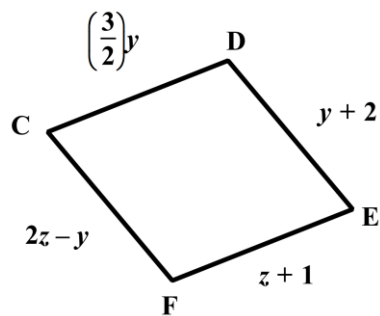
4. Given the rhombus below, find x and $m\angle MNP$

N
M
$36°$
R
$2x°$
P
Q
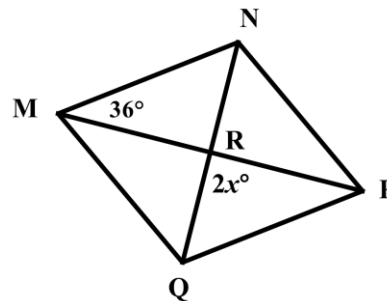
5. Given the rectangle below, find x and y.

B
$34°$
A
$112°$
C
$x°$
E
$y°$
D
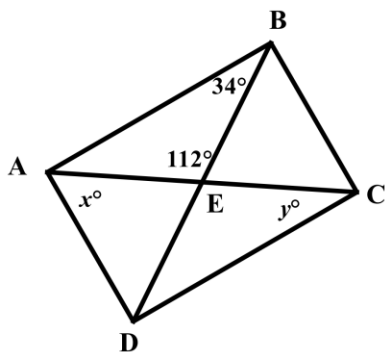
6. Given the rectangle below, find BD

B
C
8
E
A
6
D
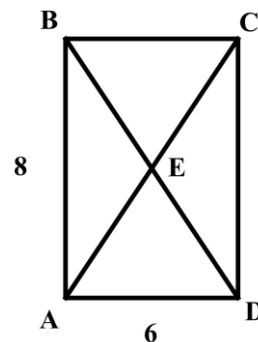
7. Given the trapezoid. Find $m\angle V$
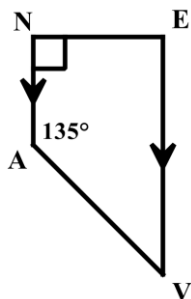
8. Given the isosceles trapezoid. Find CD
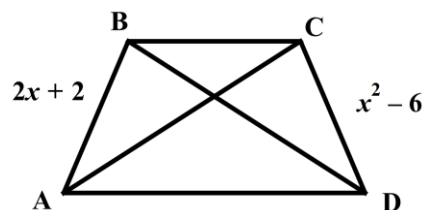
9. Given the trapezoid, find the midsegment

10. Given the trapezoid EGHK. Find GH

11. Given the kite. Find $m\angle D$

12. Given the Kite below. Find MQ

13. Given the quad below, find x .

$8x°$

$9x°$

$83°$

14. Given the Quad below, Find $m\angle D$

B

$(2x + 5)°$

A $60°$

$x°$ C

$(2x + 5)°$

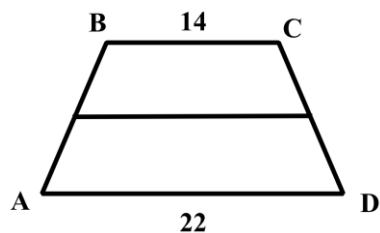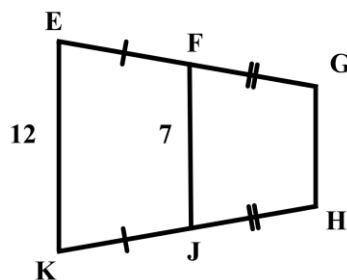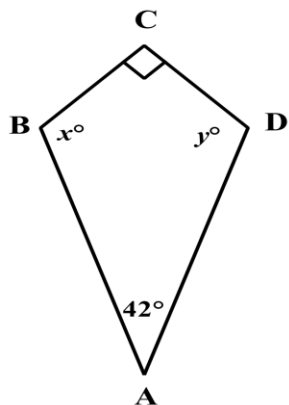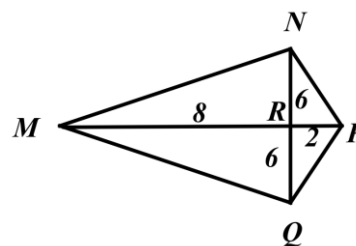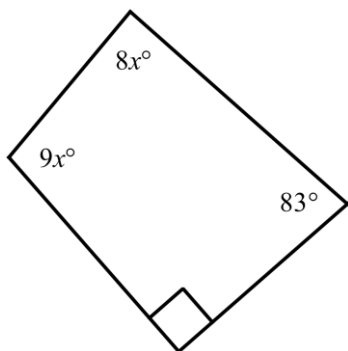D
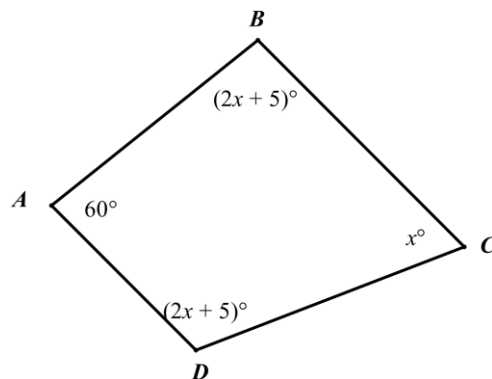
15. What is the measure of HJ in Parallelogram $FGHJ$, given the following:

$$FG = x + 7$$
$$GH = 5x + 3$$
$$m\angle F = 46°$$
$$m\angle H = (3x + 10)°$$

A. $HJ = 63$

B. $HJ = 19$

C. $HJ = 12$

D. $HJ = 8$

H _____ J

G _____ F

16. Based on the figure below, which statements are true?

$12x$

$9x + 3$ $5x + 1$

$5x$ $5x$

$6x - 4$ $10x - 2$

$12x$
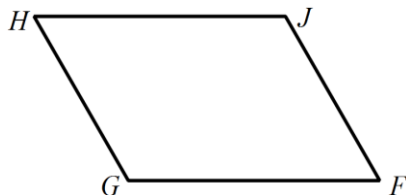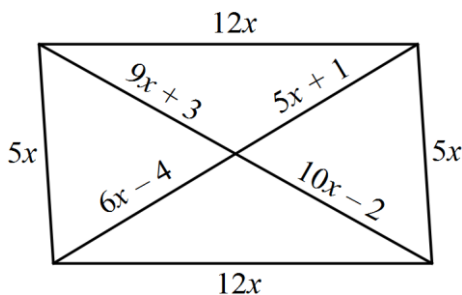
I. The figure is a rectangle

II. The figure is a parallelogram

III. $6x - 4 = 9x + 3$

IV. $9x + 3 = 10x - 2$

V. $x = 8$

VI. The longest side has a length of 60.

A. I, III, and V

B. I, IV, and VI

C. II, IV, and VI

D. II, III, and V

17. Which of the following is **not** always true of parallelogram $ABCD$?

A. $AB + BC = AD + DC$

B. $\overline{AB} \cong \overline{DC}, \overline{BC} \cong \overline{AD}$

C. $m\angle A + m\angle B = 180°$

D. $\overline{AB} \cong \overline{BC}, \overline{DC} \cong \overline{BC}$

18. A wooden frame has screws at *A, B, C,* and *D* so that the sides of it can be pressed to change the angles occurring at each vertex. $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{CD}$, even when the angles change. Why is the frame always a parallelogram?

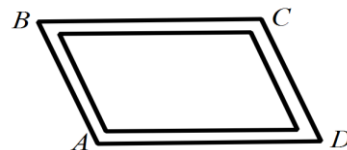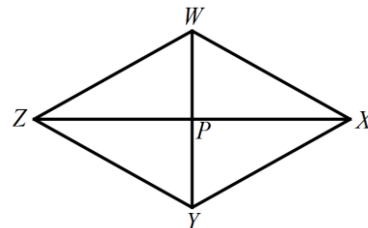**A.** The angles always stay the same, so $ABCD$ is a parallelogram.

B. All sides are congruent, so $ABCD$ is a parallelogram.

C. One pair of opposite sides is congruent and parallel, so $ABCD$ is a parallelogram.

D. One pair of opposite sides is congruent, so $ABCD$ is a parallelogram.

**19.** Given the following information, find $m\angle XYZ$:

- WXYZ is a rhombus
- $m\angle WXP = (2x + 16)°$
- $m\angle WPX = (7x + 6)°$

A. $m\angle XYZ = 160°$ **C.** $m\angle XYZ = 140°$

B. $m\angle XYZ = 120°$ **D.** $m\angle XYZ = 100°$

20. Which statement(s) is true? <u>Select all</u> that are true.

A. All quadrilaterals are parallelograms   **B.** All rectangles are parallelograms.

C. All parallelograms are rectangles.   **D.** All quadrilaterals are squares.

E. All squares are rhombuses.   **F.** All rhombuses are kites.

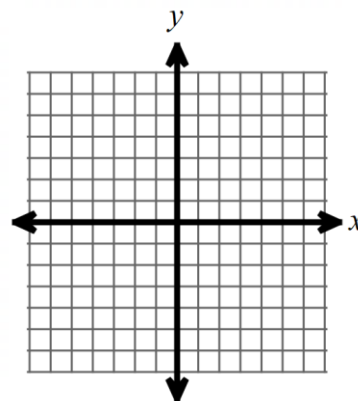**21.** Determine the most precise name for the figure with the following vertices: $D(11, 1), E(2, 4), F(6, 4), and\ G(3, 1)$

A. Parallelogram

B. Kite

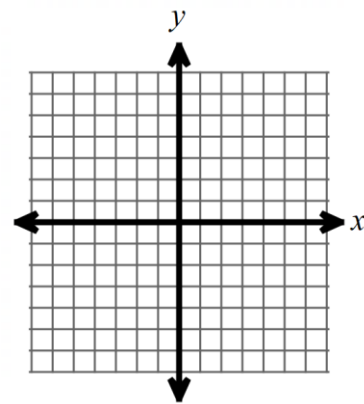**C.** Quadrilateral

D. Trapezoid
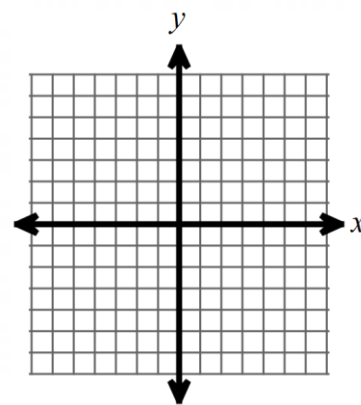
22. Determine the most precise name for the figure with the following vertices: $(-5, -6), B(-2, 0), C(4, 3), D(1, -3)$.

A. square

B. kite

C. trapezoid

D. rhombus

23. Determine the most precise name for the figure with the following vertices: $Q(3, 5), R(3, 1), S(-1, 1), and\ T(-1, 5)$
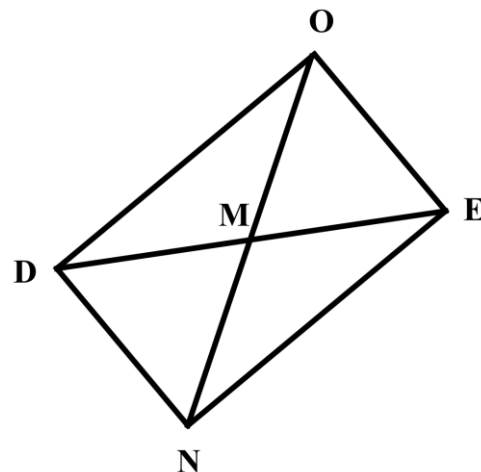
    A. Parallelogram

    B. Rectangle

    C. Rhombus

    D. Square

24. Given: *NDOE* is a parallelogram

Choose all that apply to prove that parallelogram *NDOE* is a rectangle.

    F. $\overline{NO} \cong \overline{DE}$
    G. $\overline{DN} \perp \overline{NE}$
    H. $\angle DNE \cong \angle NDO$
    I. $\overline{NO} \perp \overline{DE}$
    J. $\angle MNE \cong \angle NOE$
    K. $\overline{DO} \cong \overline{OE}$
    L. $\overline{DM} \cong \overline{ME}\ \ and\ \ \overline{NM} \cong \overline{MO}$
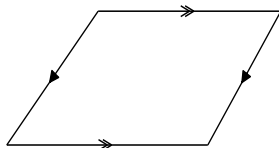

25. $\overline{RT}$ and $\overline{SU}$ are diagonals of a quadrilateral RSTU. The diagonals intersect at point *M*, so that $\overline{RM} \cong \overline{TM}$ and $\overline{RS}$ is parallel to $\overline{TU}$. Is this enough information to claim that *RSTU* is a parallelogram? Explain your reasoning.

#26-36 Identify the special quadrilateral. USE MOST SPECIFIC NAME WITH GIVEN INFORMATION, NOT DRAWN TO SCALE!!!!!! DON'T ASSUME ANYTHING!
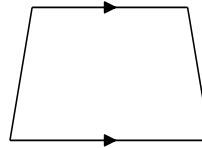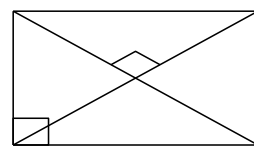
26.
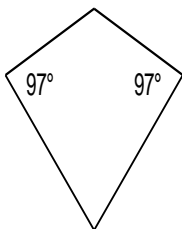
27.

28.

29.

	Square	Isos. Trapezoid	Kite	Parallelogram	Trapezoid	Rectangle	Rhombus	Quad
Consecutive Corners Supplementary								
Has 4 right angles								
Opposite Corner Angles Congruent								
Opposite Sides parallel								
All Four Sides Congruent								
The sum of the four internal angles is 360 degrees.								
Opposite Sides Congruent								
Base angles are congruent								
Only One pair of sides are parallel								
Diagonals bisect each other								
Diagonals are perpendicular to each other								
Diagonals bisect the Corners								
Diagonals are Congruent								