Lesson 6-5 LAB : Conditions of Special Parallelograms

Agenda:

- Check & Review Homework 6-4
- Notes 6.5

Homework:

- p. 422-423 # 7, 8 11-16, 24-27

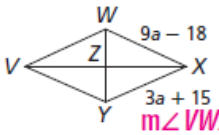
HW p. 412-413 14-15, 19, 20, 23, 25-31 odd, 44 USE Pythag

Find the measures of the numbered angles in each rectangle.

VWXY is a rhombus. Find each measure.

14. *VW* 31.5

15. m∠*VWX* and m∠*WYX* if m∠*WVY* = $(4b + 10)^\circ$ and m∠*XZW* = $(10b - 5)^\circ$

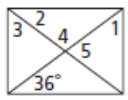


m∠*VWX* = 132°; m∠*WYX* = 66°

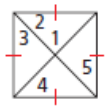
Find the measures of the numbered angles in each rhombus.

19. m∠1 = 54°; m∠2 = 36°; m∠3 = 54°; m∠4 = 108°; m∠5 = 72°

19.

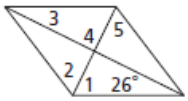


20.



20. m∠1 = 90°; m∠2 = 45°; m∠3 = 45°; m∠4 = 45°; m∠5 = 45°

23.



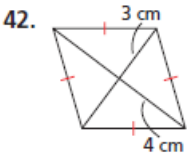
23. m∠1 = 64°; m∠2 = 64°; m∠3 = 26°; m∠4 = 90°; m∠5 = 64°

Tell whether each statement is sometimes, always, or never true.
(*Hint:* Refer to your graphic organizer for this lesson.)

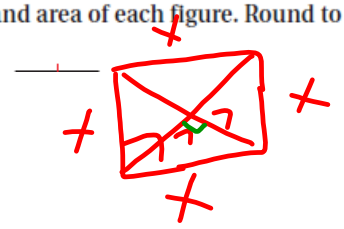
24. A rectangle is a parallelogram. A
25. A rhombus is a square. S
26. A parallelogram is a rhombus. S
27. A rhombus is a rectangle. S
28. A square is a rhombus. A
29. A rectangle is a quadrilateral. A
30. A square is a rectangle. A
31. A rectangle is a square. S

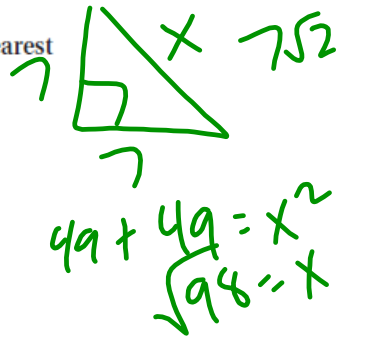
Multi-Step Find the perimeter and area of each figure. Round to the nearest hundredth, if necessary.

42.



20 cm; 24 cm^2



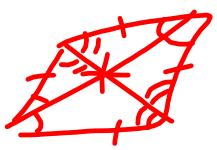


$49 + 49 = x^2$

$\sqrt{98} = x$

COMPLETE THE CHART BY PLACING A CHECK IF THE QUADRILATERAL HAS THAT PROPERTY.

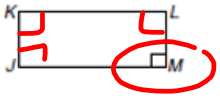
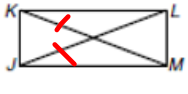
PROPERTY	PARALLELOGRAM	RECTANGLE	RHOMBUS	SQUARE
Opposite Sides are Parallel	✓	✓	✓	✓
Opposite Sides are Congruent	✓	✓	✓	✓
Opposite Angles are Congruent	✓	✓	✓	✓
Consecutive Angles are Supplementary	✓	✓	✓	✓
Four Congruent Angles (4 Right ∠'s)		✓		✓
Four Congruent Sides			✓	✓
Diagonals Bisect each other	✓	✓	✓	✓
Diagonals are Congruent		✓		✓
Diagonals are Angle Bisectors			✓	✓
Diagonals are Perpendicular			✓	✓



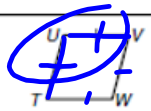
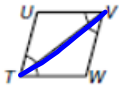
GEOMETRY + LAB Name:_____ Date:_____ Section: _____

Lesson 6-4R / 6-5L Notes: Conditions for Special Parallelograms

You can use the following conditions to determine whether a parallelogram is a rectangle.

 If one angle is a right angle, then $\square JKLM$ is a rectangle.	 $\overline{JL} \cong \overline{KM}$ If the diagonals are congruent, then $\square JKLM$ is a rectangle.

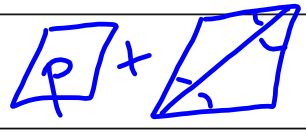
You can use the following conditions to determine whether a parallelogram is a rhombus.

 If one pair of consecutive sides are congruent, then $\square TUVW$ is a rhombus.	 If the diagonals are perpendicular, then $\square TUVW$ is a rhombus.	 If one diagonal bisects a pair of opposite angles, then $\square TUVW$ is a rhombus.

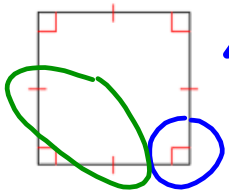
****Take out "Ways To Prove Quadrilaterals" from your Lesson Summaries or record below then transcribe:**

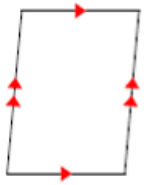
Ways to prove a quadrilateral is a rectangle:		
Show it's a parallelogram w/ 1 RT ANGLE	▱ + ∟ → RECT	
Show it's a parallelogram w/ ≅ DIAGONALS	▱ + ⨯ → RECT	
Ways to prove a quadrilateral is a rhombus:		
Show it has 4 ≅ SIDES	◇ → RHOM	
Show it's a parallelogram w/ 1 PAIR CONSEC SIDES ≅	▱ + ◇ → RHOM	
Show it's a parallelogram w/ 1 diagonals	▱ + ⨯ → RHOM	
Ways to prove a quadrilateral is a square:		
Show it is a parallelogram that is both RECT + RHOM	▱ + RECT CHOICE + RHOM CHOICE → SQUARE	

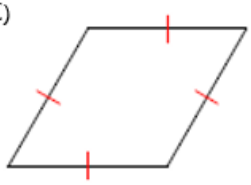
- **ADD TO RHOMBUS:**

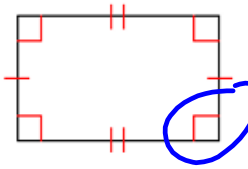
Show it's a parallelogram w/ DIAGONAL BISECTS 1 PAIR ∠'S ▱ +  → RHOM

Ex 1 Tell whether each quadrilateral is a parallelogram, rectangle, rhombus, or square. Give *all* names that apply.

A) 

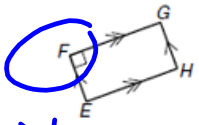
B) 

C) 

D) 

Determine whether the conclusion is valid. If not, tell what additional information is needed to make it valid.

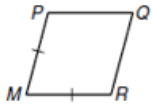
1. *EFGH* is a rectangle.



YES RECT

P + ▭ → RECT

2. *MPQR* is a rhombus.

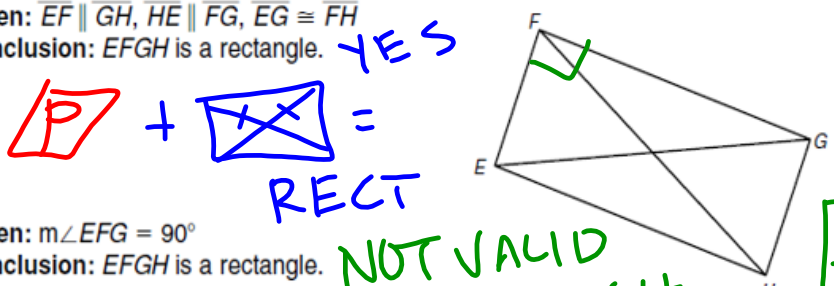


NO – NOT ALL SIDES ARE ≅

And 5

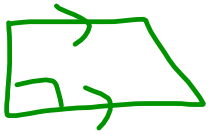
For Exercises 3 and 4, use the figure to determine whether the conclusion is valid. If not, tell what additional information is needed to make it valid.

3. **Given:** $\overline{EF} \parallel \overline{GH}$, $\overline{HE} \parallel \overline{FG}$, $\overline{EG} \cong \overline{FH}$
   Conclusion: *EFGH* is a rectangle. YES

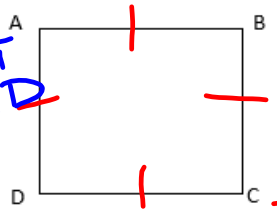


P + ☒ = RECT

4. **Given:** m∠*EFG* = 90°
   Conclusion: *EFGH* is a rectangle. NOT VALID NOT ENOUGH INFO FOR P



5. **Given:** *AB=BC=CD=AD*
   Conclusion: *ABCD is a square* NOT VALID

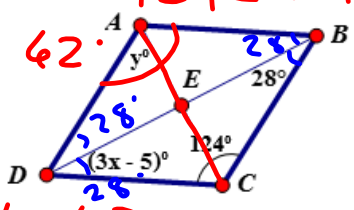


P + RHOM + RECT → SQ

NO RT ∠
NO ≅ DIAG

6. Determine the values of the variable(s) that will make the following parallelogram ABCD into a

a) Rhombus



124° = m∠DAB

62°

28°

28°

y = 62°

DIAGONAL BISECTS 1 PAIR OF ∠'S

LOOK FOR GIVEN INFO

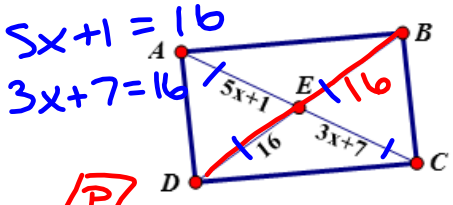
3x - 5 = 28°

3x = 33

x = 11

6. Determine the values of the variable(s) that will make the following parallelogram ABCD into a

b) Rectangle



5x+1 = 16

3x+7 = 16

DB = 32 = AC

(5x+1) + (3x+7) = 32

8x + 8 = 32

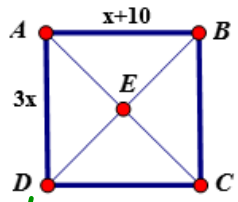
8x = 24

x = 3

□ w/ ≅ DIAGS → RECT

6. Determine the values of the variable(s) that will make the following parallelogram ABCD into a

c) Rhombus



15

15

AD = AB

3x = x+10

2x = 10

x = 5

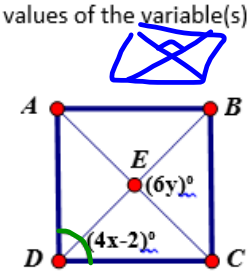
3(5) = 5+10

15 = 15 ✓

P + ◇ → RHOM

6. Determine the values of the variable(s) that will make the following parallelogram ABCD into a

d) Square



P + RHOM + RECT → SQUARE

GIVEN

6y = 90

y = 15

1 DIAG

4x-2 = 90°

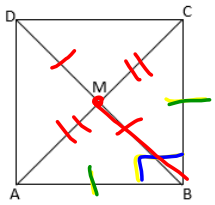
4x = 92

x = 23

7. **Given:** $\angle ABC$ is a right angle, $\overline{BA} \cong \overline{BC}$, $\overline{BM}$ is a median of $\triangle ABC$, and M is the midpoint of $\overline{BD}$

Is $ABCD$ is a square? YES

Explain:



P + RECT + RHOM → SQUARE

M MDPT OF $\overline{BD}$

$\overline{AC}$ BIS $\overline{BD}$

$\angle ABC$ IS A RT $\angle$

1 RT $\angle$

$\overline{BA} \cong \overline{BC}$

1 PAIR CONSECUTIVE SIDES $\cong$

$\overline{BM}$ IS MEDIAN $\triangle ABC$

→ M MIDPOINT OF $\overline{AC}$

→ $\overline{BD}$ BISECTS $\overline{AC}$

DIAGONALS BISECT EACH OTHER