Lesson 6-5R: Trapezoids

- Check HW 6.4/ 6.6 L
- Handouts
- Quiz
- Guided Notes 6.5

HW:

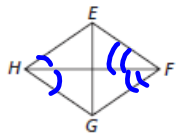
p.432-433 #27,30,32,34,35

6-5R HW p. 422-423 7, 8, 11-16, 24-27

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

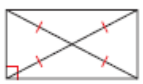
7. Given: $\overline{EG}$ and $\overline{FH}$ bisect each other. $\overline{EG} \perp \overline{FH}$
Conclusion: *EFGH* is a rhombus. valid

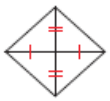
8. Given: $\overline{FH}$ bisects $\angle EFG$ and $\angle EHG$.
Conclusion: *EFGH* is a rhombus.



8. Not valid; by Thm. 6-5-5, if 1 diag. of a ▱ bisects a pair of opp. ∡, then the ▱ is a rhombus. To apply this thm., you need to know that *EFGH* is a ▱.

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

11.  ▱, rect.

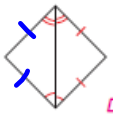
12.  ▱

13.  ▱, rect., rhombus, square

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

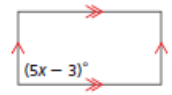
14.  ▱

15.  ▱, rect., rhombus, square

16.  ▱, rhombus

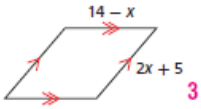
Find the value of x that makes each parallelogram the given type.

24. rectangle



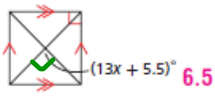
18.6

25. rhombus

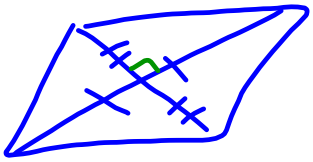


3

26. square



6.5



27. **Critical Thinking** The diagonals of a quadrilateral are perpendicular bisectors of each other. What is the best name for this quadrilateral? Explain your answer.

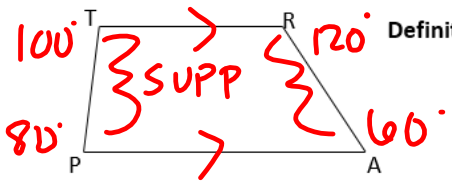
27. Rhombus; since the diags. bisect each other, the quad. is a ▱. Since the diags. of the ▱ are ⊥, the quad. is a rhombus.

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			▰	▰

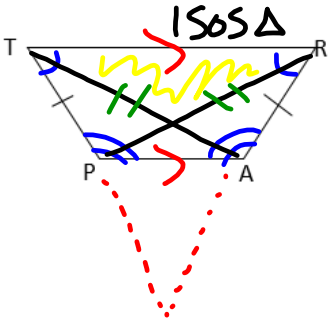
Name_____ Date_____ Section_____
Geometry + LAB

Lesson 6-5R / 6-7L: Properties of Trapezoids

Trapezoid: 

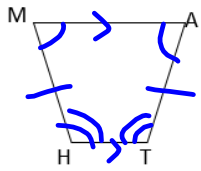
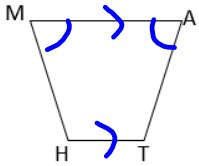
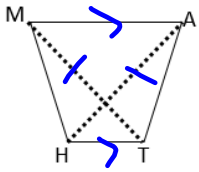
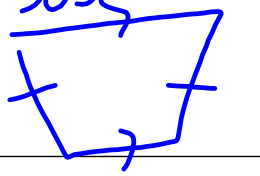
Definition: A quadrilateral with ONLY 1 PAIR of opposite sides that are ||.

What would you call a trapezoid with ≅ legs? ISOSCELES TRAPEZOID



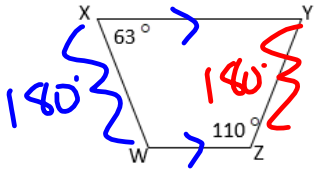
What special properties do you think it has? Why?

≅ BASE ∠'S (2 PAIRS)
≅ DIAGONALS

Thms of Isosceles Trapezoids	Diagram & Example
If a quadrilateral is an isosceles trapezoid, then its base $\measuredangle$'s are $\cong$. (both pairs)	 $\measuredangle M \cong \measuredangle A$ $\measuredangle H \cong \measuredangle T$
If a trapezoid has one pair of $\cong$ base $\measuredangle$'s , then the trapezoid is isosceles.	 ISOS TRAP 
A trapezoid is isosceles if and only if its diagonals are $\cong$.	 ISOS TRAP 

Application Problems

1. Find the measure of $\measuredangle Y$ and $\measuredangle W$ in trapezoid WXYZ. What property did you use?



$m\measuredangle X + m\measuredangle W = 180°$

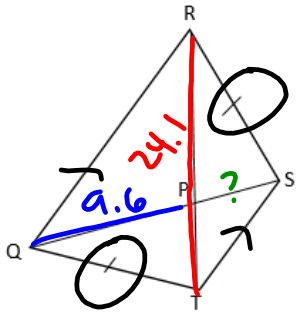
TRAP → 11 SIDES → SS INT $\measuredangle$'S SUPP

$m\measuredangle W = 117°$

$m\measuredangle Y + m\measuredangle Z = 180°$

$70° = m\measuredangle Y$

2. In trapezoid RSTQ, RT = 24.1 and QP= 9.6. Find the value of PS. Explain your reasoning:



ISOS TRAPEZOID → $\cong$ DIAG

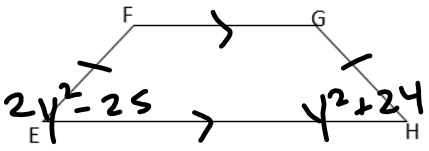
$RT = QS$

$24.1 = 9.6 + PS$

-9.6

$14.5 = PS$

3. Find the value of y such that trapezoid **EFGH** is an isosceles trapezoid when $m\measuredangle E = (2y^2 - 25)°$ and $m\measuredangle H = (y^2 + 24)°$. Explain your reasoning:



ISOS TRAP → BASE $\measuredangle$'s $\cong$

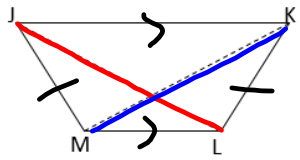
$\measuredangle E \cong \measuredangle H$

$2y^2 - 25 = y^2 + 24$

$-y^2 + 25 \quad -y^2 + 25$

$\sqrt{y^2} = \pm\sqrt{49} \quad y = \pm 7$

4. Diagonals JL & KM are drawn in isosceles trapezoid JKLM. $JL = (z^2 + 38)cm$ and $KM = (3z^2 - 12)cm$. Find the value of z and the length of JL.



ISOS TRAP → ≅ DIAG

JL = KM

$z^2 + 38 = 3z^2 - 12$

$-z^2 \quad +12 \quad -z^2 \quad +12$

$50 = 2z^2$

$\frac{50}{2} = \frac{2z^2}{2}$

$\pm\sqrt{25} = \sqrt{z^2}$

$\pm 5 = z$

$JL = z^2 + 38$

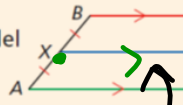
$= (5)^2 + 38$

$= 25 + 38$

$JL = 63$

Theorem 6-6-6 Trapezoid Midsegment Theorem

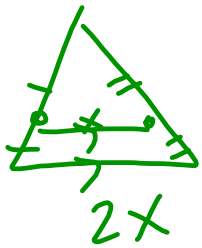
The midsegment of a trapezoid is parallel to each base, and its length is one half the sum of the lengths of the bases.



$\overline{XY} \parallel \overline{BC}, \overline{XY} \parallel \overline{AD}$

$XY = \frac{1}{2}(BC + AD)$

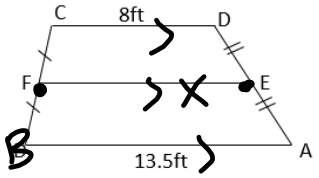
avg of bases



2x

Application Problems:

5. Find EF.



$EF = \frac{1}{2}(CD + BA)$

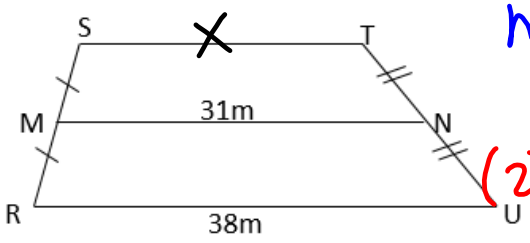
$x = \frac{1}{2}(8 + 13.5)$

$x = \frac{1}{2}(21.5)$

$x = 10.75 = EF$

ft

6. Find ST.



$MN = \frac{1}{2}(ST + RU)$

$(2)31 = \frac{1}{2}(x+38)(2)$

$\frac{31}{1} = \frac{x+38}{2}$

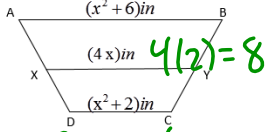
$62 = x + 38$

$-38 \quad -38$

$24 = x$

24m = ST

7. Find AB, XY and DC given $\overline{XY}$ is the midsegment of trapezoid $ABCD$.



$2^2+6 = 10$

$4(2) = 8$

$2^2+2 = 6$

$XY = \frac{1}{2}(AB + DC)$

$4x = \frac{1}{2}(x^2+6 + x^2+2)$

$4x = \frac{1}{2}(2x^2+8)$

$4x = x^2+4$

$0 = x^2-4x+4$

$0 = (x-2)(x-2)$

$x-2=0 \quad | \quad x-2=0$

$x=2 \quad | \quad x=2$