

Lesson 6-7L: Trapezoids

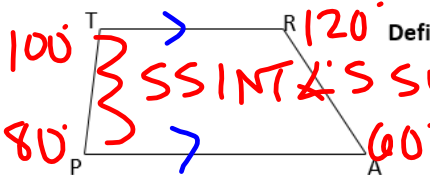
- Check HW 6.4/ 6.7 L
- Handouts
- Guided Notes 6.7

HW: 6.7

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

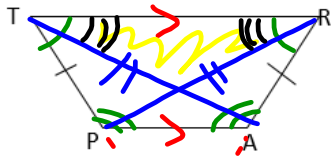
Name _____ Date _____ Section _____
 Geometry + LAB

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

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

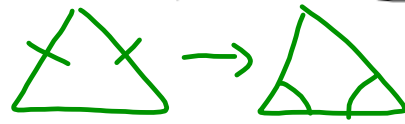
What would you call a trapezoid with 2 \cong legs? ISOS TRAPEZOID

ISOS



\cong DIAG

What special properties do you think it has? Why?

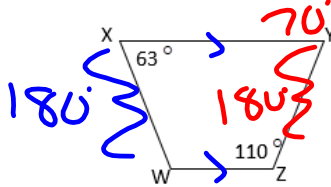


BASE \sphericalangle 'S \cong (2 PAIRS)

| Thms of Isosceles Trapezoids | Diagram & Example |
|-------------------------------------------------------------------------------------------------------------|-------------------|
| If a quadrilateral is an isosceles trapezoid, then its base \sphericalangle 's are \cong . (both pairs) | |
| If a trapezoid has <u>one</u> pair of \cong base \sphericalangle 's, then the trapezoid is isosceles. | |
| A trapezoid is isosceles if and only if its diagonals are \cong . | |

Application Problems

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



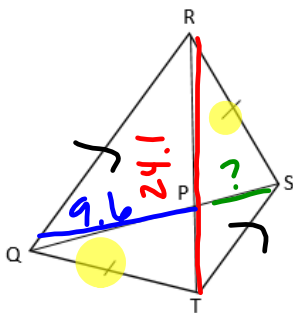
$\rightarrow \parallel \rightarrow$ SAME SIDE INT
Z'S SUPP

$$m\angle X + m\angle W = 180^\circ$$

$$63^\circ + m\angle W = 180^\circ$$

$$m\angle W = 117^\circ$$

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



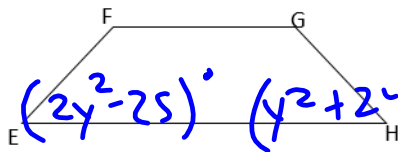
ISOS TRAP \rightarrow \cong DIAG

$$RT = QS$$

$$24.1 = 9.6 + x$$

$$14.5 = x$$

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



\Rightarrow BASE \rightarrow ISOS TRAP
 \angle 'S
 1 PAIR

$\angle E \cong \angle H$

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

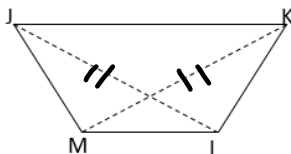
$$-y^2 + 25 \quad -y^2 + 25$$

$y^2 = 49$

$\sqrt{y^2} = \sqrt{49}$

$y = \pm 7$

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 .



$JL = 25 + 38$

$JL = 63cm$

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

$$-z^2 \quad -z^2$$

$38 = 2z^2 - 12$

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

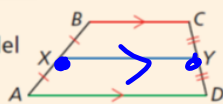
$\sqrt{25} = \sqrt{z^2}$

$\pm 5 = z$



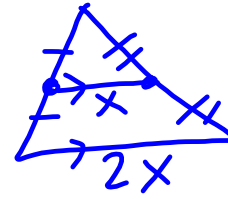
Theorem 6-6-6 Trapezoid Midsegment Theorem

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



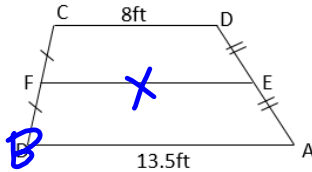
$XY \parallel BC, XY \parallel AD$
 $XY = \frac{1}{2}(BC + AD)$

avg



Application Problems:

5. Find EF.

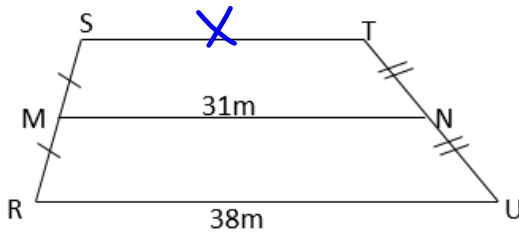


$$EF = \frac{CD + BA}{2}$$

$$EF = \frac{8 + 13.5}{2}$$

$$= \frac{21.5}{2} = 10.75 \text{ ft}$$

6. Find ST.



$$MN = \frac{ST + RU}{2}$$

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

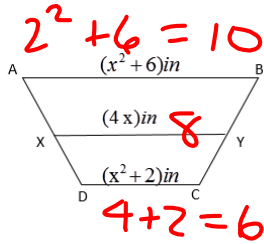
$$62 = x + 38$$

$$\begin{array}{r} 62 \\ -38 \\ \hline 24 \end{array}$$

$$24 = x$$

m

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



$$a = 1$$

$$b = -4$$

$$c = 4$$

$$XY = \frac{AB + DC}{2}$$

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

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

$$4x = x^2 + 4$$

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

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

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

$$\boxed{x = 2} \quad | \quad x = 2$$