

Quadrilaterals – Trapezoids

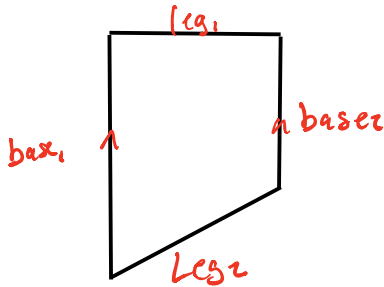
Notes Section 6.6

Name _____

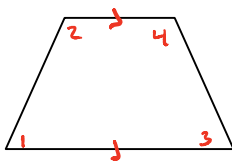
Trapezoid: a quadrilateral with exactly one pair of parallel sides.

Bases: the parallel sides of a trapezoid.

Legs: the nonparallel sides of a trapezoid.

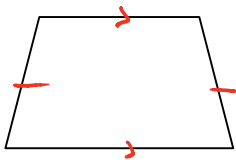


Pair of base angles: two angles in a trapezoid that share a common base.



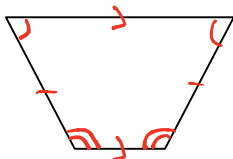
$\angle 2$ and $\angle 4$ are base angles
 $\angle 1$ and $\angle 3$ are base angles

Isosceles trapezoid: a trapezoid with congruent legs.



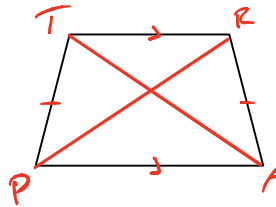
Theorem 6-16:

Both pairs of base angles of an isosceles trapezoid are congruent.



Theorem 6-17:

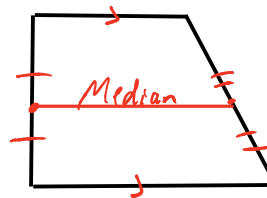
The diagonals of an isosceles trapezoid are congruent.



$$\overline{TA} \cong \overline{PR}$$

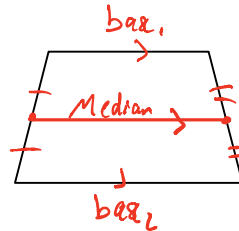
Median of a Trapezoid:

a segment that connects the midpoints of the legs.



Theorem 6-18:

The median of a trapezoid is parallel to the bases and its measure is one half the sum of the measures of the bases.



$$\text{Median} = \frac{1}{2}(b_1 + b_2)$$

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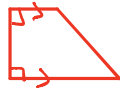
If possible, draw a trapezoid that has the following characteristics. If the trapezoid cannot be drawn, explain why.

#1) Four congruent sides.

Cannot be drawn.
If all four sides are congruent,
it must be a parallelogram

#2) ~~Exactly~~ One right angle.

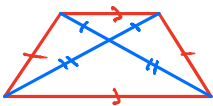
Cannot be drawn.
If there is one right angle,
then there must be another.



#3) One pair of opposite angles congruent.

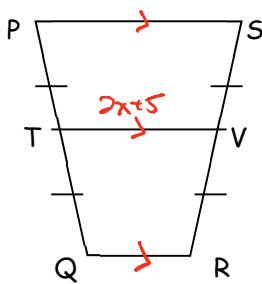
Cannot be drawn.
This would be a parallelogram.

#4) Congruent diagonals.



PQRS is an isosceles trapezoid with bases \overline{PS} and \overline{QR} .
Use the figure and the given information to solve each problem.

#5) If $\overline{TV} = 2x + 5$ and $\overline{PS} + \overline{QR} = 5x + 3$, find x .



$$\text{Median} = \frac{1}{2}(b_1 + b_2)$$

$$\overline{TV} = \frac{1}{2}(\overline{PS} + \overline{QR})$$

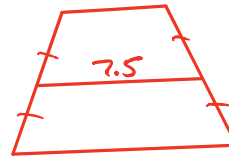
$$2x + 5 = \frac{1}{2}(5x + 3)$$

$$4x + 10 = 5x + 3$$

$$10 = x + 3$$

$$7 = x$$

#6) If the measure of the median of an isosceles trapezoid is 7.5, what are the possible integral measures for the bases?



$$\text{Median} = \frac{1}{2}(b_1 + b_2)$$

$$7.5 = \frac{1}{2}(b_1 + b_2)$$

$$15 = b_1 + b_2$$

bases \rightarrow 1, 14

2, 13

3, 12

4, 11

5, 10

6, 9

7, 8

#7) \overline{UR} is the median of a trapezoid with bases \overline{ON} and \overline{TS} . If the coordinates of the points are $U(2, 2)$, $R(6, 2)$, $O(6, -2)$, $N(0, -2)$, find the coordinates of T and S .

