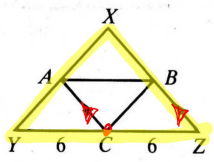
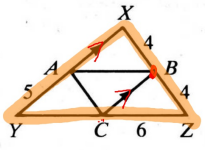
WARM-UP

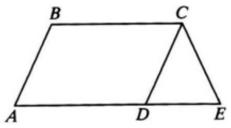
Name all the points shown that must be midpoints of the sides of the large triangle



C, A



B, C



Given: ABCD is a parallelogram;
$\overline{CD} \cong \overline{CE}$

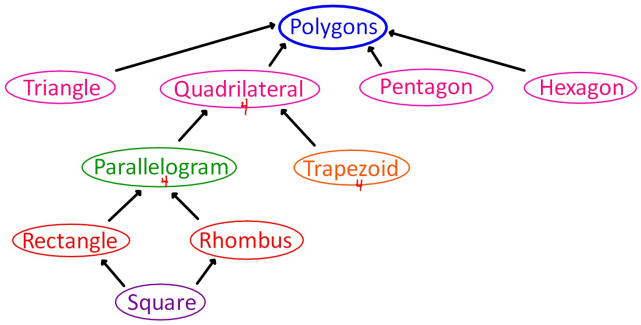
Prove $\angle A \cong \angle E$

STATEMENTS	REASONS

SECTION 5.5: TRAPEZOIDS

Standards:

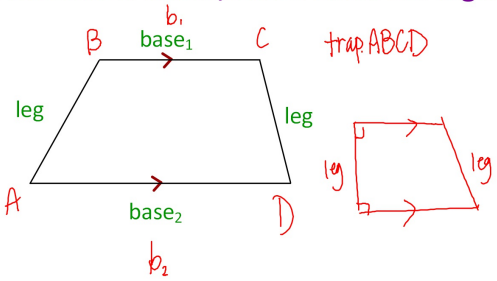
7.0: Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of a circle.



Definition:

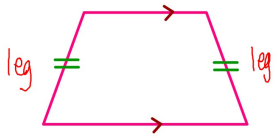
Trapezoid: a quadrilateral with EXACTLY one pair of // sides

// sides are called bases, other sides are legs.

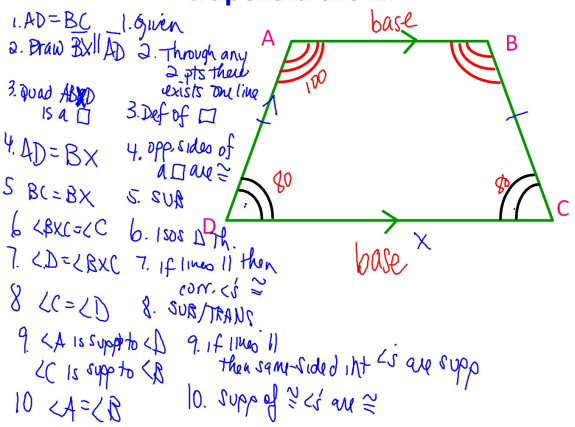


Definition:

Isosceles trapezoid:
A trapezoid with ≅ legs

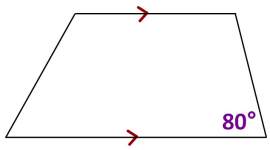


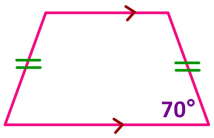
Theorem: Base angles of an isosceles trapezoid are ≅.



1. AD = BC — 1. Given
2. Draw $\overline{BX} \parallel \overline{AD}$ — 2. Through any 2 pts there exists one line
3. Quad ABXD is a □ — 3. Def of □
4. AD = BX — 4. opp sides of a □ are ≅
5. BC = BX — 5. SUB
6. ∠BXC = ∠C — 6. Isos △ Th.
7. ∠D = ∠BXC — 7. If lines ∥ then corr. ∠s ≅
8. ∠C = ∠D — 8. SUB/TRANS
9. ∠A is supp to ∠D, ∠C is supp to ∠B — 9. If lines ∥ then same-sided int ∠s are supp
10. ∠A = ∠B — 10. Supp of ≅ ∠s are ≅

Find as many missing angles as possible.

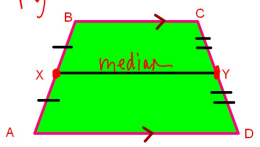




DEFINITION

Median: segment that joins midpts of legs.

of a trapezoid

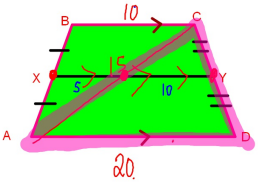


$\overline{XY}$ is the median.

THEOREM

The median of a trapezoid is:

1. parallel to the bases
2. has a length equal to the average of the base lengths.



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

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

OR

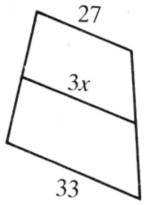
$\text{median} = \frac{b_1 + b_2}{2}$

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

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

1-7: Each diagram shows a trapezoid and its median. Find the value of x.

1)



$2 \cdot \frac{27+33}{2} = 3x \cdot 2$

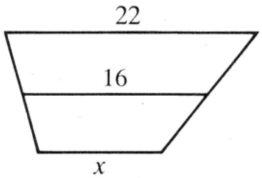
$60 = 6x$

$10 = x$

ANSWER:

1-7: Each diagram shows a trapezoid and its median. Find the value of x.

2)



$\frac{22+x}{2} = 16$

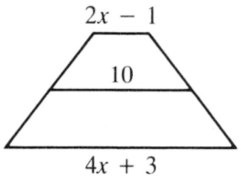
$22 + x = 32$

$x = 10$

ANSWER:

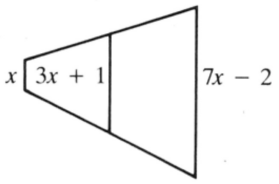
1-7: Each diagram shows a trapezoid and its median. Find the value of *x*.

3)



ANSWER: x = 3

4)



$(2)\frac{x+(7x-2)}{2} = (3x+1)(2)$

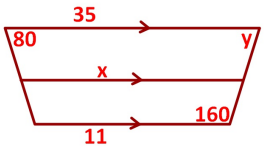
$8x-2 = 6x+2$

$2x = 4$

$x = 2$

ANSWER:

5)

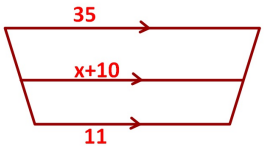


$$x = \frac{11+35}{2}$$

$x = 23; y = 20$

Answer

6)



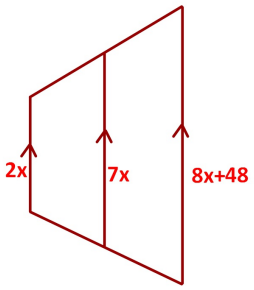
$$x + 10 = \frac{11+35}{2}$$

$x + 10 = 23$

$x = 13$

Answer

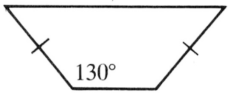
7)



Answer $x = 12$

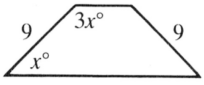
8-9: Find the measure of each angle in the isosceles trapezoid.

8)



ANSWER: 50, 50, 130

9)

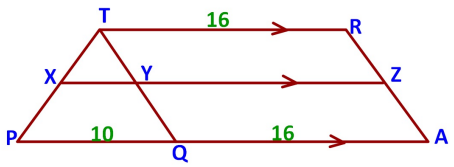


ANSWER: 45, 45, 135

10) An isosceles trapezoid has sides of length 7, 12, 7, and 22. Find the length of the median.

Answer 17

11)



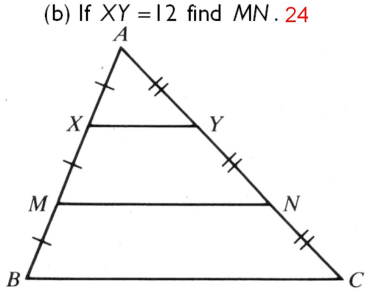
If $\overline{XZ}$ is a median of trap. TRAP, then XZ = 21 and XY = 5

Answer

12-15: In $\triangle ABC$, $AX = XM = MB$ and $AY = YN = NC$.

12) (a) If $XY = 6$ and $BC = 18$, find MN. 12

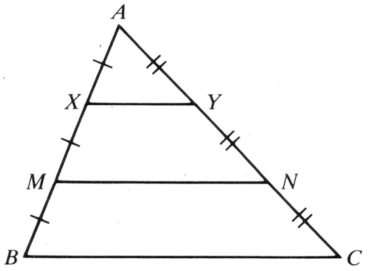
(b) If $XY = 12$ find MN. 24



ANSWER:

12-15: In $\triangle ABC$, $AX = XM = MB$ and $AY = YN = NC$.

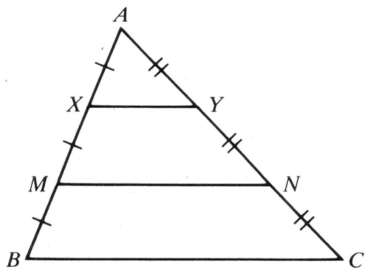
13) If $XY = 9$ then $MN =$ 18 and $BC =$ 27



ANSWER:

12-15: In $\triangle ABC$, $AX = XM = MB$ and $AY = YN = NC$.

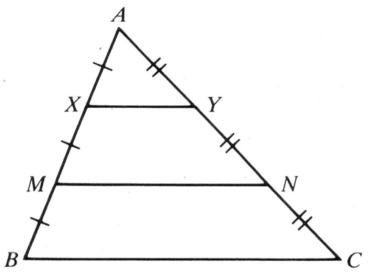
14) If $MN = 32$ then $XY =$ 16 and $BC =$ 48



ANSWER:

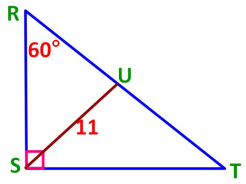
12-15: In $\triangle ABC$, $AX = XM = MB$ and $AY = YN = NC$.

15) If $XY = 8$ and $MN = x + 12$ then $x =$ 4 and $BC =$ 24



ANSWER:

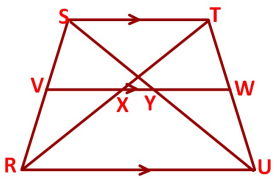
U is the midpoint of $\overline{RT}$. Find RU and m$\angle$UST.



11; 30°

Answer

Given: trapezoid RSTU with median $\overline{VW}$.



What is the relationship between VX and YW?

If ST = 10 and RU = 18, find VX, XY, and YW

Answer

VW=14
VX=5
YW=5
XY=4