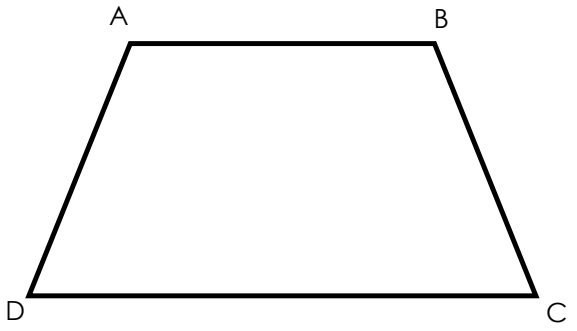
6.5 Trapezoids

Objective: Students will be able to use the properties of trapezoids to solve problems involving trapezoids

Trapezoid

a _____ with only one pair of _____ sides



Facts about Trapezoids

Bases are parallel

_____ || _____

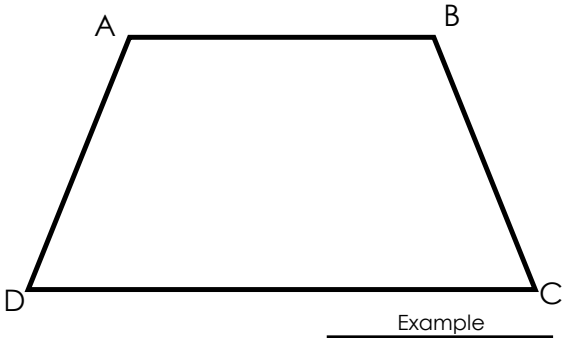
Angles on the same leg are Supplementary

_____ + _____ = 180

_____ + _____ = 180

Isosceles Trapezoid

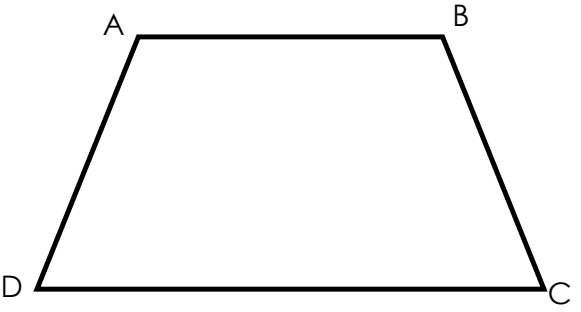
Trapezoid with _____ legs



1. _____

_____

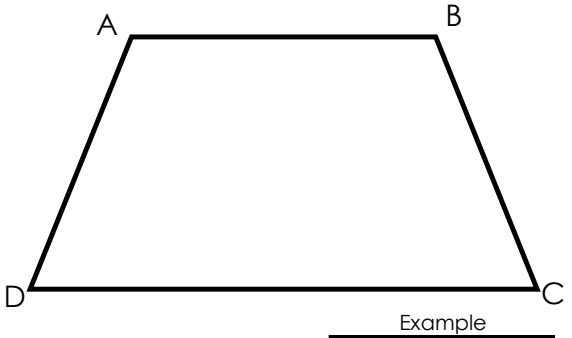
Example



2. _____

_____

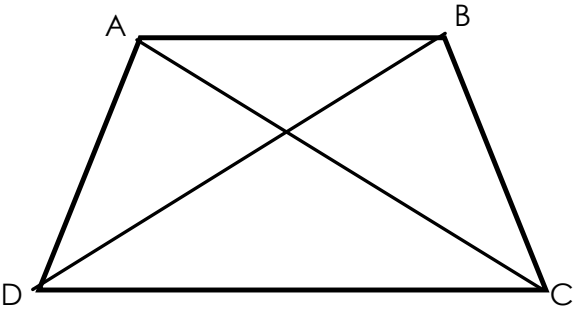
Example



3. _____

_____

Example



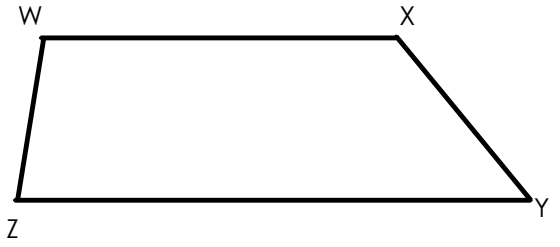
4. _____

_____

Example

In the diagram below of trapezoid WXYZ, WX ll YZ. Name the bases and the legs of the trapezoid.

Bases	Legs
_____ ll _____	_____ and _____

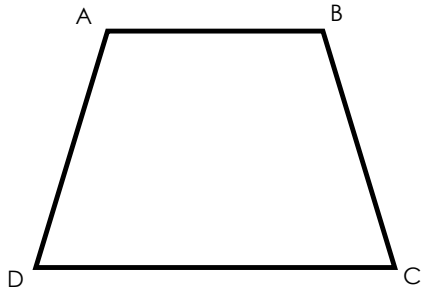


In the diagram below of **isosceles** trapezoid ABCD, AB ll DC, m∠A = 34, and AD = 12 in. Find the value of the missing angles and sides.

Properties:

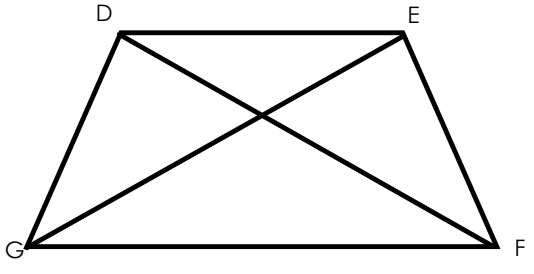
1._____

2._____



In the diagram below of **isosceles** trapezoid DEFG, DE ll GF, DF = 42. Find the value of EG.

Property: _____

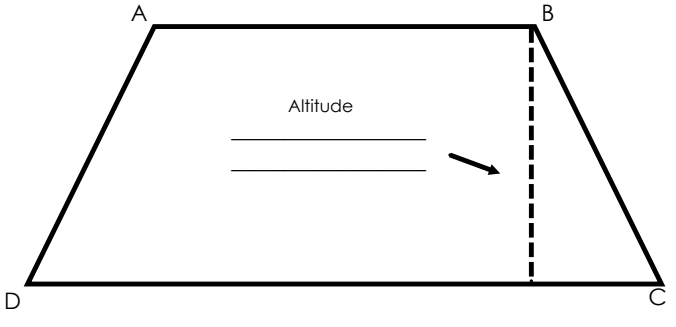


In isosceles trapezoid ABCD, AD ≅ BC. If AB = 20, DC = 36, and AD = 17, what is the length of the **altitude** of the trapezoid?

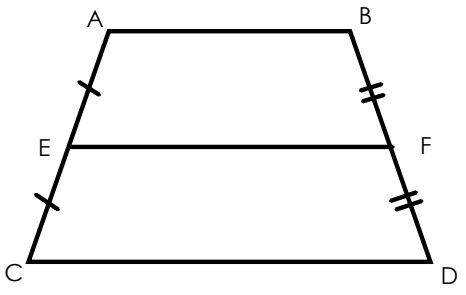
Step 1: Find the difference in length between the top and bottom base

Step 2: Divide by two

Step 3: Use pythagorean theorem



Trapezoid Midsegment Formula

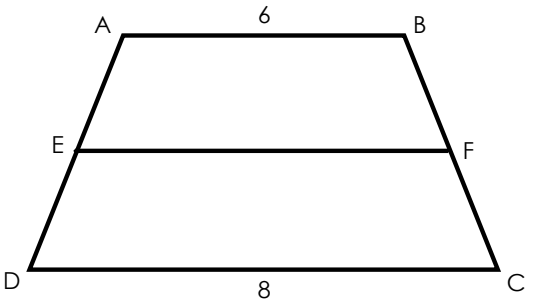


$$\text{\_\_\_\_\_} = \frac{(\quad) + (\quad)}{2}$$

Another word for midsegment is _____

In the diagram below of trapezoid ABCD, AB ll DC, E is the midpoint of AD , and F is the midpoint of BC. Find the length of EF.

$$\text{\_\_\_\_\_} = \frac{(\quad) + (\quad)}{2}$$

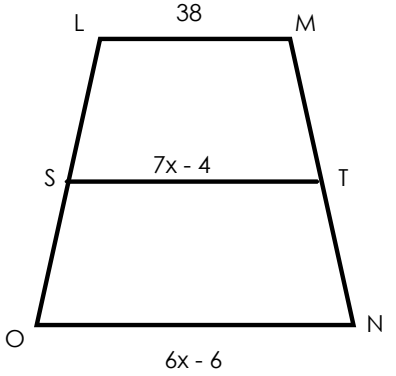


JK is the **median** of trapezoid XWYZ . Find the length of XW.

$$\text{\_\_\_\_\_} = \frac{(\quad) + (\quad)}{2}$$

In the diagram below of trapezoid LMNO, LM ll ON, S is the midpoint of LO , and T is the midpoint of MN. Find the length of ST.

$$\text{\_\_\_\_\_} = \frac{(\quad) + (\quad)}{2}$$



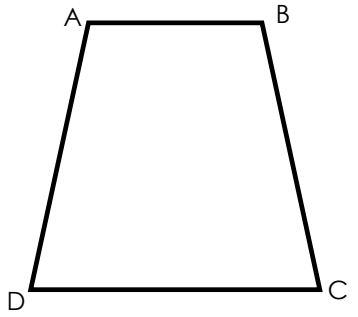
Independent Practice

In the diagram below of **isosceles** trapezoid ABCD, AB ll CD, m∠D =47. Find the measure of all missing angles.

Properties:

1._____

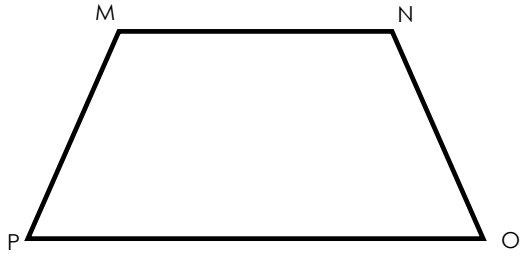
2._____



m∠A= _____ m∠B = _____ m∠C = _____

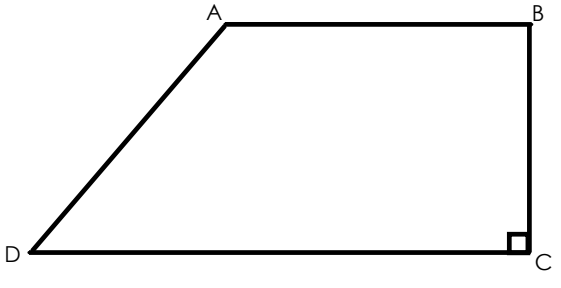
In the diagram below of **isosceles** trapezoid MNOP, AB ll DC, and we know diagonal MO = 68 mm. Draw diagonals MO and NP and find the length of NP.

Property:



In the diagram below of trapezoid ABCD, AB ll CD, AD = 3, BC = 2, m∠A = 107 and ∠C is a right angle.Find the value of the missing angles

Is trapezoid WXYZ a isosceles trapezoid? How do you know?



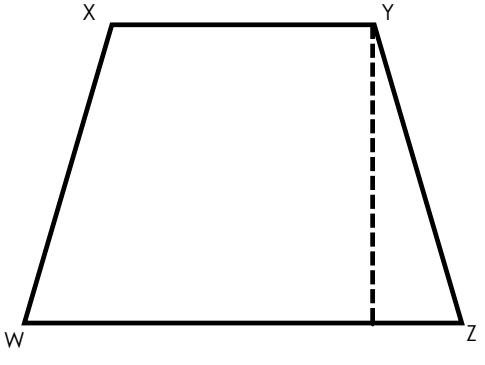
m∠B = _____ m∠D= _____

In isosceles trapezoid ABCD, XW ≅ YZ. If XW = 10, XY = 12, and AD = 20, what is the length of the altitude of the trapezoid?

Step 1: Find the difference in length between the top and bottom base

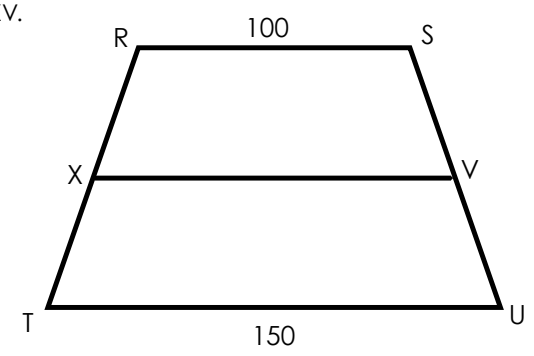
Step 2: Divide by two

Step 3: Use pythagorean theorem

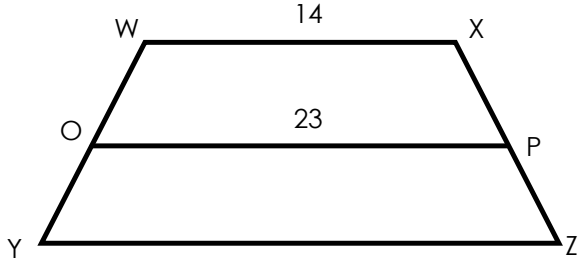


In the diagram below of trapezoid RSUT, RS ll TU, X is the midpoint of RT , and V is the midpoint of SU. Find the length of XV.

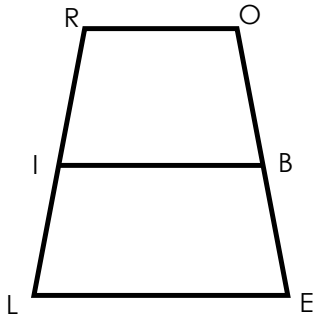
$$\text{\_\_\_\_\_} = \frac{(\quad) + (\quad)}{2}$$



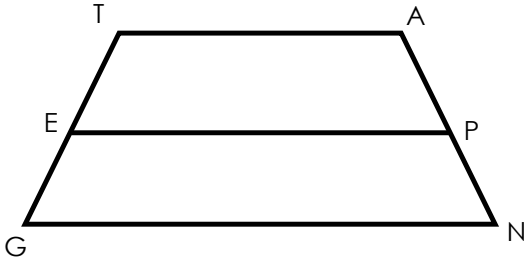
OP is the median of trapezoid WXZY. What is the length of YZ?



IB is the median of trapezoid ROEL. RO = 2x, LE = 5x, and IB = 49. What is the value of x?

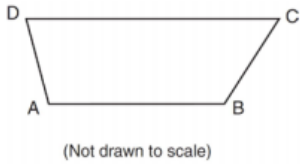


EP is the median of trapezoid TANG. TA = 2x +11, GN = 4x - 7, and EP = 4x - 12. What is the length of TA, GN, and EP. (hint: solve for x and plug in!)



CHALLENGE TIME. STEP UP.

In the diagram below, $\overline{AB}$ and $\overline{CD}$ are bases of trapezoid $ABCD$.



If $m\angle B = 123$ and $m\angle D = 75$, what is $m\angle C$?

1) 57
2) 75
3) 105
4) 123

Isosceles trapezoid $ABCD$ has diagonals $\overline{AC}$ and $\overline{BD}$. If $AC = 5x + 13$ and $BD = 11x - 5$, what is the value of x?

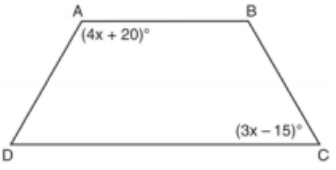
1) 28
2) $10\frac{3}{4}$
3) 3
4) $\frac{1}{2}$

Draw here:

In isosceles trapezoid $JKLM$, leg $JK = 5x - 10$, base $KL = 6x + 2$, and leg $LM = 2x + 8$. Find the value of x.

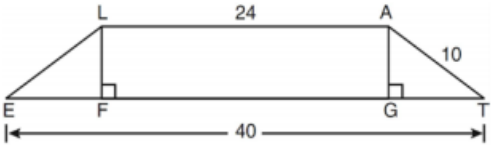
[A] $-\frac{2}{3}$ [B] $\frac{3}{2}$ [C] 6 [D] -12

In the diagram of trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \cong \overline{BC}$, $m\angle A = 4x + 20$, and $m\angle C = 3x - 15$.



What is $m\angle D$?

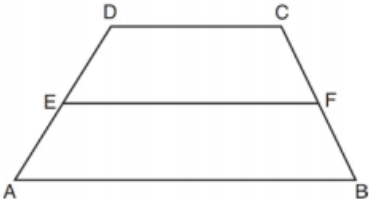
In the diagram below, $LATE$ is an isosceles trapezoid with $\overline{LE} \cong \overline{AT}$, $LA = 24$, $ET = 40$, and $AT = 10$. Altitudes $\overline{LF}$ and $\overline{AG}$ are drawn.



What is the length of $\overline{LF}$?

1) 6
2) 8
3) 3
4) 4

In the diagram below, $\overline{EF}$ is the median of trapezoid $ABCD$.



If $AB = 5x - 9$, $DC = x + 3$, and $EF = 2x + 2$, what is the value of x?

1) 5
2) 2
3) 7
4) 8