

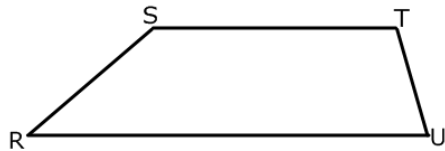
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Chapter 10: Quadrilaterals
Topic 5: Trapezoid

Trapezoid:

A **trapezoid** is a quadrilateral that has only one set of parallel sides.

Diagram:

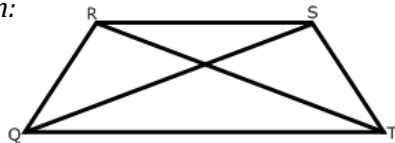


Properties:

- Only one set of parallel sides (bases).
- The non-parallel sides are called legs.

Isosceles Trapezoid:

Diagram:

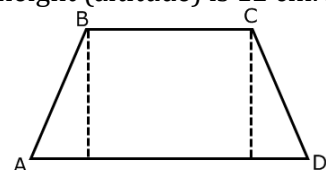


Properties:

- All the properties of a trapezoid
- Non-parallel sides are congruent.
- Diagonals are congruent.
- Base angles are congruent.
- Opposite angles are supplementary.

Word Problems:

1.) The bases of an isosceles trapezoid ABCD measure 10 cm and 20 cm. The height (altitude) is 12 cm. How long are the legs AB and CD?



2.) Given: Isosceles trapezoid ABCD with $BC \parallel AD$. If $m\angle A = 4x + 20$ and $m\angle D = 2x + 38$, find $m\angle A$, $m\angle B$, $m\angle C$, and $m\angle D$.

3.) In isosceles trapezoid KIME, $\angle K$ and $\angle E$ are the base angles. If $IK = 11$ and $ME = 3x - 1$, what is the value of x ?

4.) In isosceles trapezoid ABCD, $BC \parallel AD$. The measure of $\angle ADC = 4x + 20$ and the measure of $\angle DAB = 8x - 20$. Find the value of x , $\angle ADC$, $\angle DAB$, $\angle BCD$, and $\angle ABC$.

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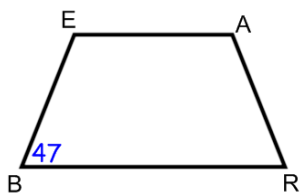
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Topic 5 Homework: Trapezoid

Directions: Answer the following questions completely. If needed, include a diagram with your answer.

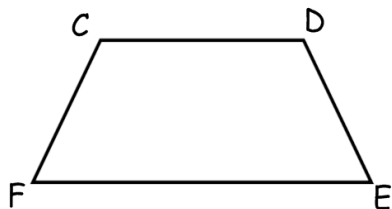
For questions 1-6, answer the following with the response of True or False:

- 1) A trapezoid has one pair of parallel sides. _____
- 2) In an isosceles trapezoid, the non-parallel sides are congruent. _____
- 3) In a rhombus, all sides are congruent. _____
- 4) In a rectangle, diagonals are perpendicular. _____
- 5) In an isosceles trapezoid, opposite angles are congruent. _____
- 6) All quadrilaterals are rectangles. _____
- 7) Given the following diagram of an isosceles trapezoid, find the measures of all of the angles.

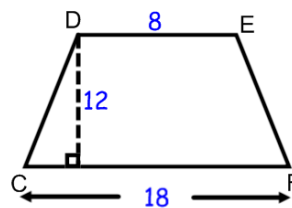


- 8) $ABCD$ is an isosceles trapezoid with bases AB and DC . If $AD = 3x + 4$ and $BC = x + 12$. Find the value of x and the length of AD .

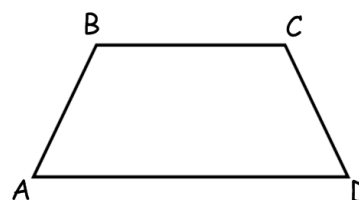
- 9) $CDEF$ is a trapezoid with $CD \parallel FE$. If $m\angle F$ and $m\angle C$ are in the ratio 1:4, find the measure of $\angle F$.



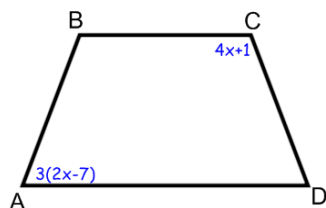
10) In the accompanying diagram, isosceles trapezoid $CDEF$ has bases of lengths 8 and 18 and an altitude with a length of 12. Find the length of CD .



11) Given isosceles trapezoid $ABCD$, $BC \parallel AD$. If $m\angle A = 4x - 3$ and $m\angle D = 2x + 1$, find the value of x .



12) Given isosceles trapezoid $ABCD$, $BC \parallel AD$. If $m\angle A = 3(2x - 7)$ and $m\angle C = 4x + 1$, find the value of x . Find the measure of all of the angles.

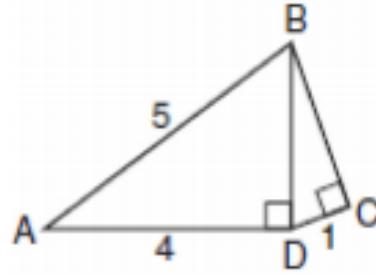


13) In isosceles trapezoid $ABCD$, $AB \parallel CD$. $AB = 18$, $CD = 6$, and $AD = 10$. Find the length of an altitude of $ABCD$.

Review Section:

14) Find the equation of a line that is perpendicular to $3x + 6y = 18$ and passes through the point $(6, -8)$.

15) In the accompanying diagram of right triangle ABD and DBC, $AB=5$, $AD=4$, and $CD=1$. Find the length of \overline{BC} , to the nearest tenth.



16) Which of these lengths could be the sides of a triangle?

- | | |
|--------------|---------------|
| (1) 15,7,23 | (2) 5, 9, 13 |
| (3) 8, 5, 13 | (4) 6, 15, 23 |

17) In the diagram below, under which transformation will $\Delta A'B'C'$ be the image of ΔABC ?

- (1) Rotation
- (2) Dilation
- (3) Translation
- (4) Glide Reflection

