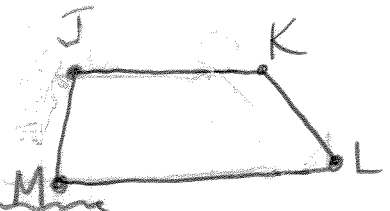
6-6 Trapezoids & Kites Practice

Name_____

Date_____ Block_____

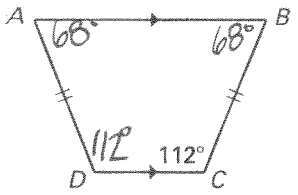
Draw a trapezoid *JKLM* with *JK* ∥ *LM*. Match the pair of segments or angles with the term, which describes them in trapezoid *JKLM*.

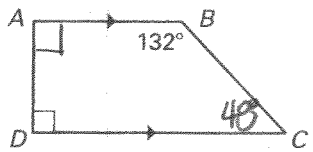


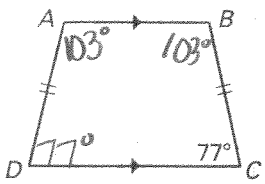
1. $\overline{JK}$ and $\overline{ML}$ E
2. $\overline{MJ}$ and $\overline{KL}$ F
3. $\overline{ML}$ and $\overline{KL}$ B
4. $\angle K$ and $\angle M$ C
5. $\overline{JL}$ and $\overline{KM}$ D
6. $\angle M$ and $\angle L$ A

A. bases angles
B. consecutive sides
C. opposite angles
D. diagonals
E. bases
F. legs

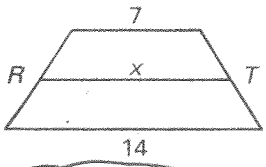
Find the angle measures of *ABCD*.

7. 

8. 

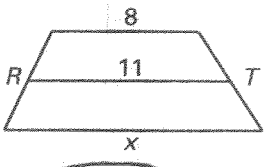
9. 

The midsegment of the trapezoid is $\overline{RT}$. Find the value of *x*.

10. 

$\frac{7+14}{2}$

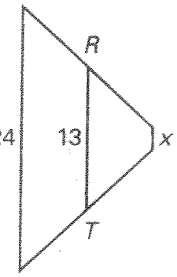
$x = 10.5$

11. 

$\frac{8+x}{2} = 11$

$8+x=22$

$x = 14$

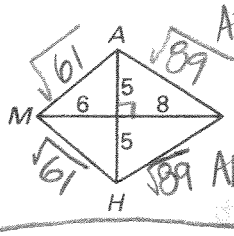
12. 

$\frac{x+24}{2} = 13$

$x+24=26$

$x=2$

Find the length of the sides to the nearest hundredth or the measure of the angles in kite *MATH*.

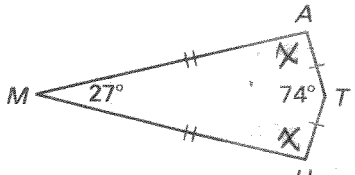
13. 

$AT = \sqrt{25+64}$

$AM = \sqrt{25+36}$

$AT = TH = \sqrt{89} \approx 9.43$

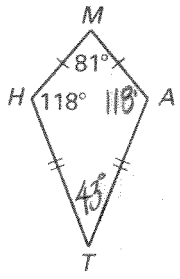
$AM = MH = \sqrt{61} \approx 7.81$

14. 

$m\angle A + m\angle H = 259$

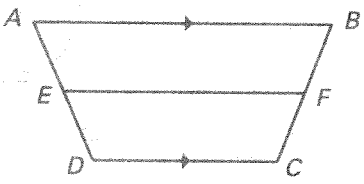
$2x = 259$

$x = 129.5°$

15. 

Quadrilateral *ABCD* is a trapezoid with midsegment $\overline{EF}$. Use the given information to answer the following.

4. If $m\angle B = 73°$, then $m\angle C =$? 107°
5. If $m\angle A = 51°$ and $m\angle C = 105°$, then $m\angle D =$? 129°
6. If $m\angle A = 48°$ and $m\angle C = 112°$, then $m\angle CFE =$? 68°
7. If $AB = 28$ and $DC = 13$, then $EF =$? 20.5
8. If $EF = 13$ and $DC = 6$, then $AB =$? 20
9. If $EF = x + 5$ and $DC + AB = 4x + 6$, then $EF =$? 7



$\frac{4x+6}{2} = x+5$

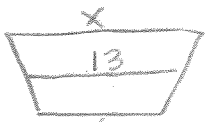
$4x+6 = 2x+10$

$2x = 4$

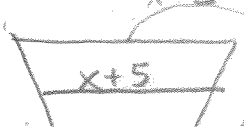
$x = 2$

5. 

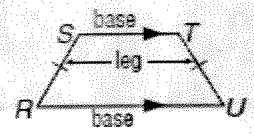
6. 

8. 

$\frac{x+6}{2} = 13$

9. 

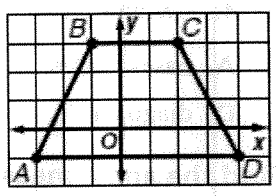
Properties of Trapezoids A **trapezoid** is a quadrilateral with exactly one pair of parallel sides. The parallel sides are called **bases** and the nonparallel sides are called **legs**. If the legs are congruent, the trapezoid is an **isosceles trapezoid**. In an isosceles trapezoid both pairs of **base angles** are congruent.



STUR is an isosceles trapezoid. $\overline{SR} \cong \overline{TU}$; $\angle R \cong \angle U$, $\angle S \cong \angle T$

Example

The vertices of *ABCD* are $A(-3, -1)$, $B(-1, 3)$, $C(2, 3)$, and $D(4, -1)$. Verify that *ABCD* is a trapezoid.

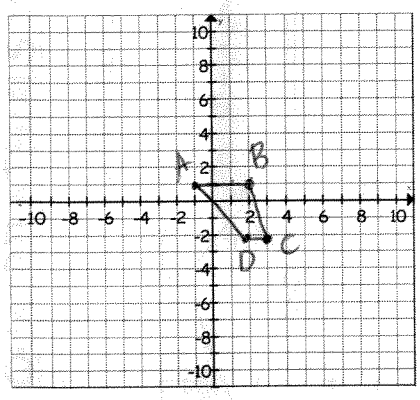


$$\text{slope of } \overline{AB} = \frac{3-(-1)}{-1-(-3)} = \frac{4}{2} = 2 \qquad AB = \sqrt{(-3-(-1))^2 + (-1-3)^2}$$
$$= \sqrt{4+16} = \sqrt{20} = 2\sqrt{5}$$
$$\text{slope of } \overline{AD} = \frac{-1-(-1)}{4-(-3)} = \frac{0}{7} = 0 \qquad CD = \sqrt{(2-4)^2 + (3-(-1))^2}$$
$$= \sqrt{4+16} = \sqrt{20} = 2\sqrt{5}$$
$$\text{slope of } \overline{BC} = \frac{3-3}{2-(-1)} = \frac{0}{3} = 0$$
$$\text{slope of } \overline{CD} = \frac{-1-3}{4-2} = \frac{-4}{2} = -2$$

Exactly two sides are parallel, $\overline{AD}$ and $\overline{BC}$, so *ABCD* is a trapezoid. $AB = CD$, so *ABCD* is an isosceles trapezoid.

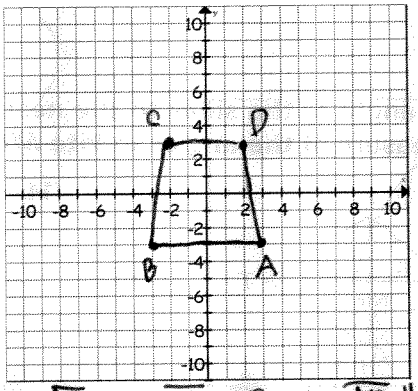
Determine whether ABCD is a trapezoid. If so, determine whether it is an isosceles trapezoid. Show your work to justify your answer.

1. $A(-1, 1)$, $B(2, 1)$, $C(3, -2)$, and $D(2, -2)$



$m\overline{AB} = 0$ $m\overline{CD} = 0$
$\therefore \overline{AB} \parallel \overline{CD}$, which proves it is a trapezoid b/c a trap. has only 1 pr. of ‖ sides.

2. $A(3, -3)$, $B(-3, -3)$, $C(-2, 3)$, and $D(2, 3)$



$m\overline{AB} = m\overline{CD} = 0$ so $\overline{AB} \parallel \overline{CD}$ which proves it is a trapezoid.
$BC = \sqrt{1^2+6^2} = \sqrt{37}$; $AD = \sqrt{1^2+6^2} = \sqrt{37}$
$\overline{BC} \cong \overline{AD}$ $\therefore$ it is an isosceles trapezoid

Determine whether EFGH is a kite. E(1,3), F(5,0), G(1,-6), and H(-3, 0). Show your work to justify your answer.

3. Verify that *EFGH* is a kite.

$EH = \sqrt{3^2+4^2} = \sqrt{25} = 5$
$EF = \sqrt{3^2+4^2} = \sqrt{25} = 5$
$HG = \sqrt{4^2+6^2} = \sqrt{52}$
$FG = \sqrt{4^2+6^2} = \sqrt{52}$

EFGH is a kite because it has 2 pair of $\cong$ consecutive sides.