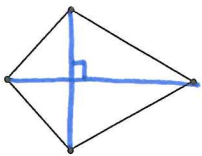
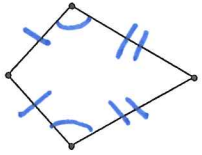
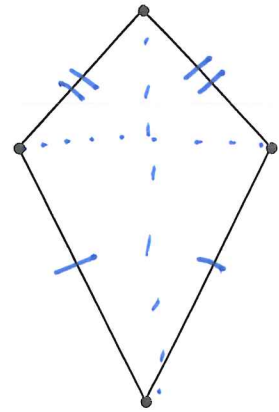


# Kites Notes

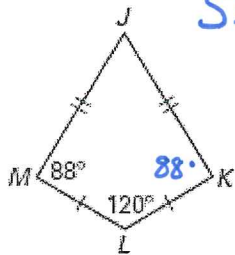
Key

A Kite is a quadrilateral that has two pairs of congruent sides  
**BUT** opposite sides are *not* congruent

The diagonals are perpendicular.	
Exactly one pair of opposite angles are congruent.	

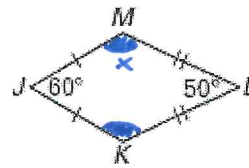


$JKLM$  is a kite. Find  $m\angle K$ .



$S = 180(4-2)$   
 $S = 360^\circ$

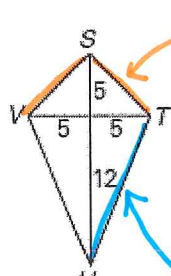
$120 + 88 + 88 + \angle J = 360$   
 $\angle J = 64^\circ$



$60 + 50 + x + x = 360$   
 $2x + 110 = 360$   
 $2x = 250$   
 $x = 125$

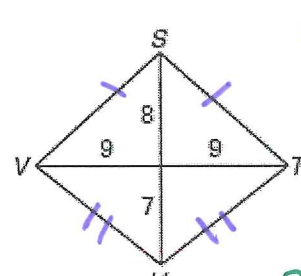
$\angle M = 125^\circ$   
 $\angle K = 125^\circ$

Use Theorem 8.18 and the Pythagorean Theorem to find the side lengths of the kite. Write the lengths in simplest radical form.



$5^2 + 5^2 = ST^2$   
 $\sqrt{50} = ST$   
 $5\sqrt{2} = ST$   
 $SV = 5\sqrt{2}$

$5^2 + 12^2 = TU^2$   
 $\sqrt{169} = TU$   
 $13 = TU$   
 $VU = 13$

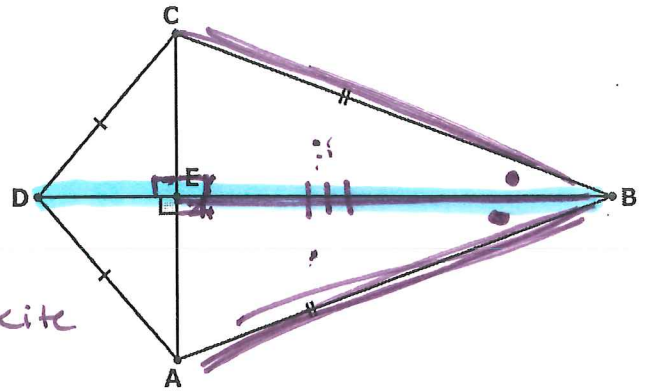


$8^2 + 9^2 = ST^2$   
 $\sqrt{145} = ST$   
 $\sqrt{145} = SV$

$9^2 + 7^2 = TU^2$   
 $\sqrt{130} = TU$   
 $VU = \sqrt{130}$

# Proving Kite and Trapezoid Properties

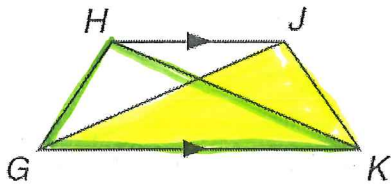
- 1.) Given: Kite  $ABCD$ ,  $DC=DA$ ,  $CB=AB$ ,  $\angle DEC=90^\circ$   
 Prove:  $m\angle CBD = m\angle ABD$



1. Kite  $ABCD$ ,  $DC \cong DA$   
 $CB \cong AB$ ,  $\angle DEC = 90^\circ$
2.  $\angle CEB = 90^\circ$ ,  $\angle AEB = 90^\circ$
3.  $EB \cong EB$
4.  $\triangle CEB \cong \triangle AEB$
5.  $\angle CBD \cong \angle ABD$

1. given
2. diags of a kite are  $\perp$ .
3. reflexive
4. HL
5. c.p.t.c

- 2.) Given:  $\overline{HJ} \parallel \overline{GK}$ ,  
 $\triangle HGK \cong \triangle JKG$ ,  $\overline{HG} \nparallel \overline{JK}$   
 Prove:  $GHIK$  is an isosceles trapezoid.



one pair of  $\parallel$  sides w/  
 legs  $\cong$

1.  $\overline{HJ} \parallel \overline{GK}$   
 $\triangle HGK \cong \triangle JKG$   
 $\overline{HG} \nparallel \overline{JK}$  (legs)

2.  $\overline{HG} \cong \overline{JK}$

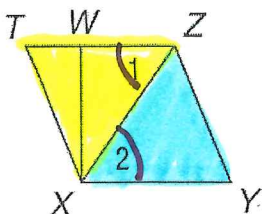
3.  $GHIK$  is an isosceles trapezoid

1. given

2. c.p.t.c

3. def of isos. trap.

- 3.) Given:  $\triangle TZX \cong \triangle YXZ$ ,  
 $\overline{WX} \parallel \overline{ZY}$   
 Prove:  $XYZW$  is a trapezoid.



one pair of  $\parallel$  sides.

1.  $\triangle TZX \cong \triangle YXZ$   
 $\overline{WX} \parallel \overline{ZY}$

2.  $\angle 1 \cong \angle 2$

3.  $TZ \parallel YX$

4.  $XYZW$  is a trapezoid

1. given

2. c.p.t.c

3.  $\cong$  alt. int  $\angle$ s form  $\parallel$  lines.

4. def of trapezoid.

Name: Key Kites and Trapezoids Worksheet

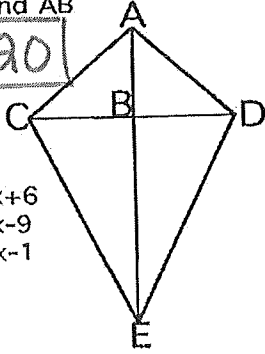
Chap: Quads

Assign: 31C

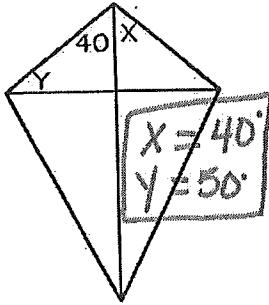
1.) Given Kite ADEC  
Find AB

$AB = 20$

$CB = 3x + 6$   
 $BD = 8x - 9$   
 $AB = 7x - 1$

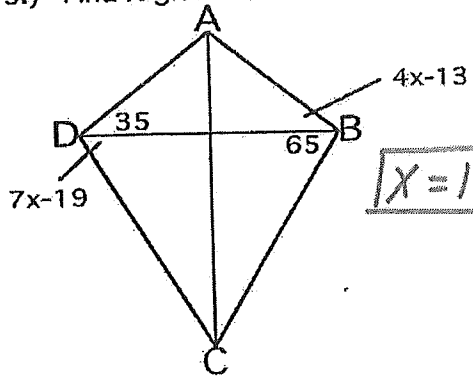


2.) Given Kite ABCD  
Find X and Y

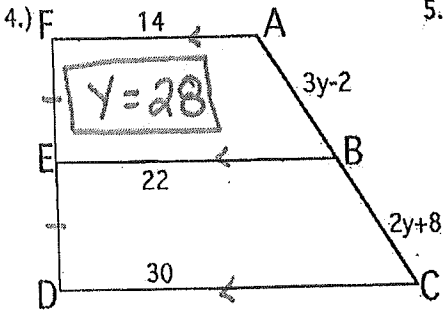


$X = 40^\circ$   
 $Y = 50^\circ$

3.) Find X given Kite ABCD



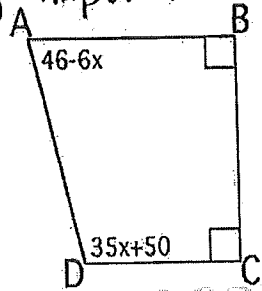
$X = 12$



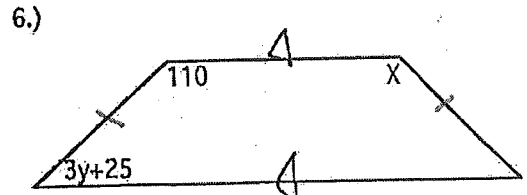
Find AB

$Y = 28$

5.) Trapezoid ABCD



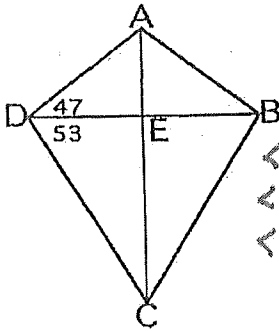
Find  $m\angle D = 151.4^\circ$



Find X and Y

$X = 110$   
 $Y = 15$

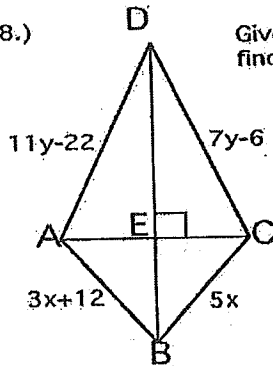
7.) Given Kite ABCD



Find  $m\angle ABC$   
 $m\angle CED$   
 $m\angle CEB$

$\angle ABC = 100^\circ$   
 $\angle CED = 90^\circ$   
 $\angle CEB = 90^\circ$

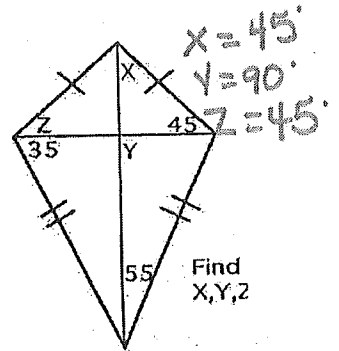
8.)



Given Kite DCBA  
find AD and CB

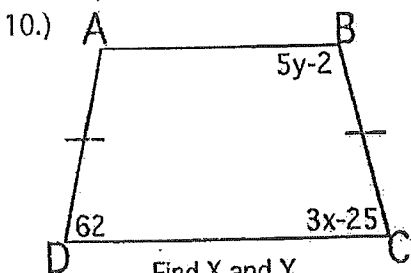
$X = 6$   
 $Y = 4$

9.)



$X = 45^\circ$   
 $Y = 90^\circ$   
 $Z = 45^\circ$

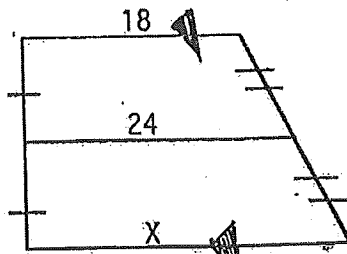
Find X, Y, Z



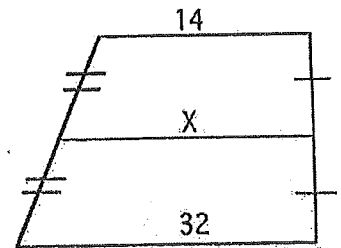
Find X and Y

$X = 29$   
 $Y = 24$

11.)



$X = 30$



$X = 23$

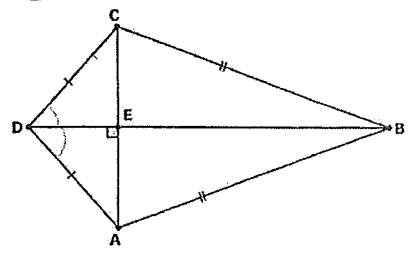
Name: Key Date: \_\_\_\_\_ Hour: \_\_\_\_\_

# ACC Geo: Kites and Trapezoids Proofs & Practice

1.) Use Kite ABCD

Given:  $DC=DA, CB=AB, \angle DEC=90^\circ$   
 Prove:  $m\angle CDE=m\angle ADE$

Some proof  
 as # 2 in notes...  
 basically.



2.) Use Kite ABCD

Given:  $DC=DA, CB=AB, \angle DEC=90^\circ$   
 Prove:  $CE=EA$

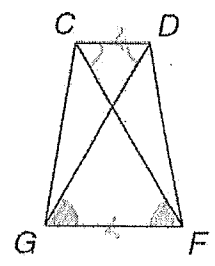
Some type  
 of proof as  
 # 2 in notes

$\triangle DEC \cong \triangle DEA$  by HL  
 $CE = EA$  cpctc

3.) Given: CDFG is an isosceles trapezoid with bases CD and FG.

Prove:  $m\angle DGF=m\angle CFG$

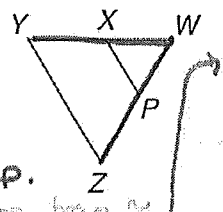
1. given
2.  $CG \cong DF$  2. def of isosce trap.
3.  $CF \cong DG$  3. diags of trap.  $\cong$
4.  $\angle G \cong \angle F$  4. reflexive
5.  $\triangle DGF \cong \triangle CFG$  5. SSS
6.  $\angle DGF \cong \angle CFG$  6. cpctc



4.) Given: ZYXP is an isosceles trapezoid.

Prove:  $\triangle PWX$  is isosceles.

1. given
2.  $YX \cong PZ$  2. def of isos. trap.
3.  $\angle Y \cong \angle Z$  3. base  $\angle$ s of isos. trap.  $\cong$
4.  $YW \cong ZW$  4.  $\cong$  base  $\angle$ s form isosc  $\triangle$ .
5.  $YW = YX + XW$  5. Segment addition
6.  $ZW = PZ + WP$

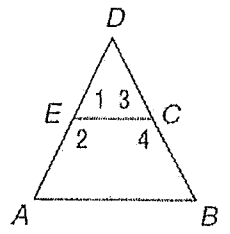


6.  $YX + XW = PZ + WP$  6. substitution
7.  $PZ + XW = PZ + WP$  7. subtraction
8.  $XW = WP$  8. subtraction
9.  $\triangle PWX$  is isosc. 9. def of isosceles  $\triangle$

5.) Given: E is the midpoint of AD and C is the midpoint of DB.  $AD=DB$  and  $m\angle A=m\angle 1$ .

Prove: ABCD is an isosceles trapezoid.

1. given
2.  $EC \parallel AB$  2.  $\cong$  corr.  $\angle$ s form  $\parallel$
3.  $\frac{1}{2} AD = \frac{1}{2} DB$  3. multiplication
4.  $EA = CB$  4. def of mid pt
5. ABCD is isosc. trap. 5. def of isosc. trapezoid



# Geometry Worksheet

## Kites and Trapezoids

Name: Key  
 Period: \_\_\_\_\_

### I. Kites and Trapezoids: Solve.

1. Kite Perimeter = 64

2. Kite  $x = \underline{72^\circ}, y = \underline{61^\circ}$

3. Isosceles Trapezoid  $x = \underline{52^\circ}, y = \underline{128^\circ}$

4. Kite's Perimeter=86 ft  $x = \underline{6}, y = \underline{5}$

$2(6y-2) + 2(3y) = 86$   
 $12y - 4 + 6y = 86$   
 $18y - 4 = 86$   
 $18y = 90$   
 $y = 5$

$5x - 15 = 2x + 3$   
 $3x = 18$   
 $x = 6$

5. Isosceles Trapezoid's Perimeter=164 cm  $x = \underline{14.14^\circ}, y = \underline{38 cm}$

$y+12 + y + y + 12 + y - 12 = 164$   
 $4y + 12 = 164$   
 $y = 38$

$7x = 99$

6. Isosceles Trapezoid's Perimeter=85 cm  $x = \underline{15}$

7. Kite  $x = \underline{21}, y = \underline{146^\circ}$

8. Trapezoid  $x = \underline{20}, y = \underline{\frac{45}{7}}$

$18y + 10y = 180$   
 $y = \frac{45}{7} \approx 6.43$

$18 + 3x + 5 = 180$   
 $3x = 160$   
 $x = 20$

9. Kite  $x = \underline{13}, y = \underline{31^\circ}$

$41 + 90 + 4x - 3 = 180$   
 $4x = 52$   
 $x = 13$

10. Isosceles Trapezoid's Perimeter=88 ft  $x = \underline{14}$

$3x + 2 + 24 + x - 4 + x - 4 = 88$   
 $5x + 18 = 88$   
 $5x = 70$   
 $x = 14$

11.  $x = \underline{64^\circ}, y = \underline{43}$

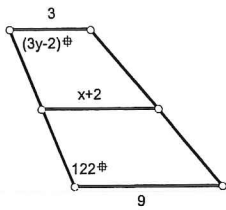
$137 + y = 180$   
 $y = 43$

12.  $x = \underline{12}, y = \underline{49}$



II. Midsegment of Trapezoids. Show your work.

13. Trapezoid with Midsegment

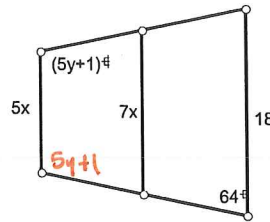


$$\begin{aligned} x &= \underline{4} \\ y &= \underline{20} \end{aligned}$$

$$x+2 = \frac{1}{2}(9+3)$$

$$3y-2+122 = 180$$

14. ISOSCELES TRAPEZOID with Midsegment

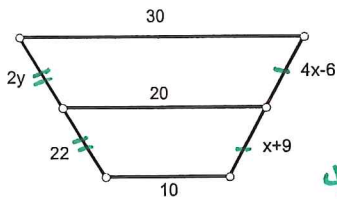


$$\begin{aligned} x &= \underline{2} \\ y &= \underline{23} \end{aligned}$$

$$7x = \frac{1}{2}(5x+18)$$

$$5y+1+64 = 180$$

15. 10. Trapezoid with Midsegment

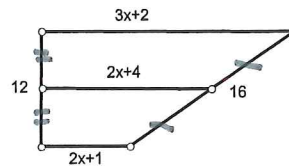


$$\begin{aligned} x &= \underline{5} \\ y &= \underline{11} \end{aligned}$$

$$4x-6 = x+9$$

$$2y = 22$$

16. Trapezoid with Midsegment



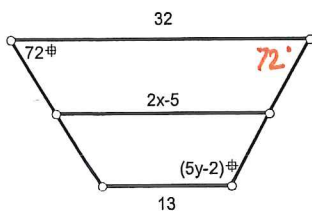
$$\begin{aligned} x &= \underline{5} \\ \text{Perimeter} &= \underline{56} \end{aligned}$$

$$2x+4 = \frac{1}{2}(2x+1+3x+2)$$

$$4x+8 = 5x+3$$

$$x = 5$$

17. Isosceles Trapezoid with Midsegment



$$\begin{aligned} x &= \underline{13.75} \\ y &= \underline{22} \end{aligned}$$

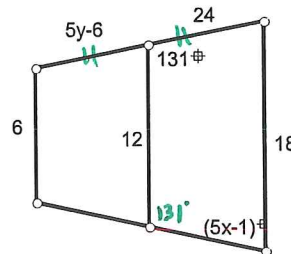
$$2x-5 = \frac{1}{2}(32+13)$$

$$4x-10 = 45$$

$$x = 13.75$$

$$72 + 5y - 2 = 180$$

18. Isosceles Trapezoid with Midsegment



$$\begin{aligned} x &= \underline{10} \\ y &= \underline{6} \end{aligned}$$

$$5y-6 = 24$$

$$131 + 5x - 1 = 180$$