

Name KEY

Date \_\_\_\_\_

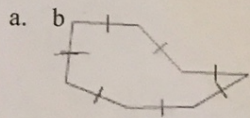
Period \_\_\_\_\_

Geometry w/ Trig

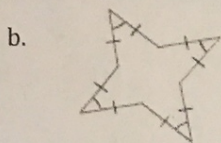
**Unit 9 Quadrilaterals Review**

(1.6, 6.1, 6.2, 6.4, 6.5, 6.6, 11.1, 11.2)

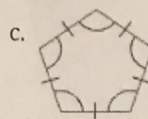
- 1) For each polygon below, i) Name each polygon by the number of sides; ii) Classify it as convex or concave; and iii) Use the best term to classify the polygon as equilateral, equiangular, regular or irregular.



- i) Heptagon (7)  
 ii) Concave  
 iii) Equilateral



- i) Octagon (8)  
 ii) Concave  
 iii) Equilateral

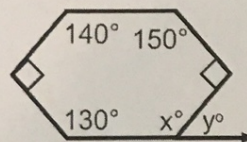


- i) Pentagon (5)  
 ii) Convex  
 iii) Regular

- 2) Solve for x and y in the diagram to the right.

Sum of interior  $\angle$ s =  $(6-2)(180)$   
 $= 720$

$140 + 150 + 90 + 130 + 90 + x = 720$   
 $600 + x = 720$   
 $x = 120$



$y + 120 = 180$   
 $y = 60$

- 3) Answer the following questions. Show all work.

- a. The sum of the measures of the interior angles of an animal pen is  $900^\circ$ . How many sides does the pen have?

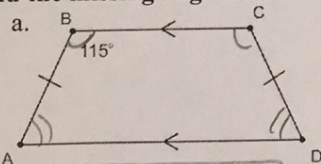
$(n-2)(180) = 900$   
 $n-2 = 5$   
 $n = 7$

7 sides

- b. If the measure of each interior angle of a regular polygon is  $108^\circ$ , how many sides does the polygon have?

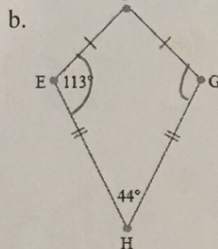
$(n-2)(180) = 108n$   
 $180n - 360 = 108n$   
 $72n = 360$   
 $n = 5$

- 4) Find the missing angle measures of the given figure.



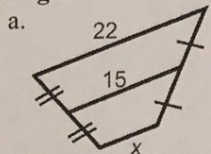
$m\angle C = 115^\circ$   
 $m\angle A = 65^\circ$   
 $m\angle D = 65^\circ$

All  $\angle$ s have sum of  $360^\circ$

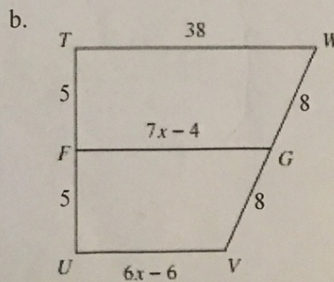


$m\angle G = 113^\circ$   
 $m\angle F = 360 - 113 - 113 - 44$   
 $m\angle F = 90^\circ$

- 5) Each figure below is a trapezoid. Find the value of x.

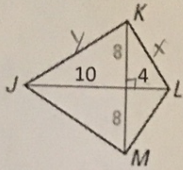


$15 = \frac{1}{2}(22 + x)$   
 $30 = 22 + x$   
 $x = 8$



$7x - 4 = \frac{1}{2}(38 + 6x - 6)$   
 $7x - 4 = \frac{1}{2}(32 + 6x)$   
 $7x - 4 = 16 + 3x$   
 $4x = 20$   
 $x = 5$

6) JKLM is a kite. Answer the following.



a. What are the side lengths of the kite? (Leave answers as simplified radicals - NO decimals!)

$$4^2 + 8^2 = x^2$$

$$16 + 64 = x^2$$

$$\sqrt{80} = \sqrt{x^2} \rightarrow x = \sqrt{80}$$

$$x = 4\sqrt{5}$$

$$8^2 + 10^2 = y^2 \rightarrow y = \sqrt{164}$$

$$64 + 100 = y^2 \rightarrow y = 2\sqrt{41}$$

$$JK = 2\sqrt{41}$$

$$JM = 2\sqrt{41}$$

$$KL = 4\sqrt{5}$$

$$LM = 4\sqrt{5}$$

b. To find these side lengths, which property of a kite did you apply?

Diagonals are perpendicular

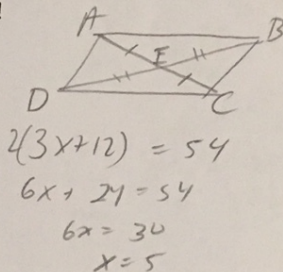
7) Complete the statement with *sometimes*, *always*, or *never*.

- a. A kite is never a parallelogram.
- b. A rhombus is always equilateral.
- c. If two of the angles of a trapezoid are congruent, then the trapezoid is Sometimes isosceles.
- d. The diagonals of a parallelogram are Sometimes angle bisectors.

**Multiple Choice: SHOW ALL WORK. Then, circle the correct answer.**

8) ABCD is a parallelogram with diagonals intersecting at E. If  $AE = (3x + 12)$  m. and  $AC = 54$  m., find the value of  $x$ . Draw a diagram!

- a. 5  
b. 7  
c. 13  
d. 14



$$2(3x + 12) = 54$$

$$6x + 24 = 54$$

$$6x = 30$$

$$x = 5$$

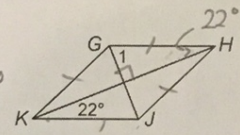
9) For rhombus GHJK, find  $m\angle 1$ .

- a.  $22^\circ$   
b.  $44^\circ$   
c.  $68^\circ$   
d.  $90^\circ$

$$m\angle 1 = x$$

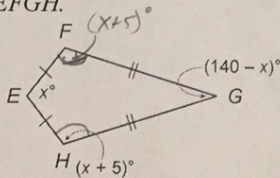
$$x + 22 + 90 = 180$$

$$x = 68$$



10) Find the value of  $x$  in kite EFGH.

- a. 70  
b. 105  
c. 90  
d. 150



$$2(x+5) + x + 140 - x = 360$$

$$2x + 10 + x + 140 - x = 360$$

$$2x = 210$$

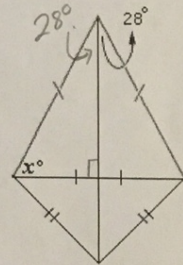
$$x = 105$$

11) Find the value of  $x$  in the polygon.

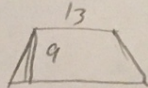
Kite

$$x + 28 + 90 = 180$$

$$x = 62$$



12) The area of a trapezoid is 126 square inches. Its height is 9 feet and the length of one of the bases is 13 feet. Find the length of the second base.



$$A = \frac{1}{2}h(b_1 + b_2)$$

$$126 = \frac{1}{2}(9)(13 + x)$$

$$126 = 4.5(13 + x)$$

$$28 = 13 + x$$

$$x = 15$$

$15 \text{ ft}$

13) GEOM is a square with diagonals intersecting at T. If  $ET = 6$  cm., find the perimeter of the square. Draw a diagram!

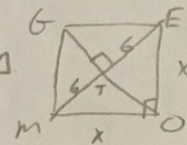
Diagonals create 45-45-90  $\Delta$

$$\frac{1}{1} \frac{1}{1} \frac{\sqrt{2}}{12}$$

$$\frac{1}{x} = \frac{\sqrt{2}}{12}$$

$$12 = x\sqrt{2}$$

$$x = \frac{12}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{12\sqrt{2}}{2} = 6\sqrt{2}$$



$$P = 4 \cdot 6\sqrt{2}$$

$P = 24\sqrt{2} \text{ cm}$

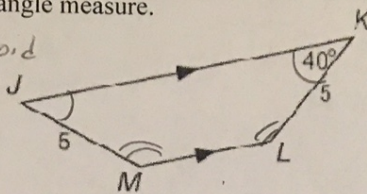
14) Determine what type of quadrilateral  $JMLK$  is. Then, find every missing angle measure.

Isosceles Trapezoid

$$m\angle J = 90^\circ$$

$$m\angle M = 140^\circ$$

$$m\angle L = 140^\circ$$



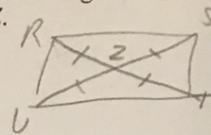
15)  $RSTU$  is a rectangle with diagonals intersecting at  $Z$ . If  $RZ = 3x + 8$  and  $ZS = 6x - 28$ , find  $UZ$ .

$$3x + 8 = 6x - 28$$

$$36 = 3x$$

$$x = 12$$

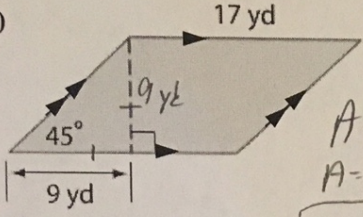
$$UZ = 3(12) + 8 = \boxed{44}$$

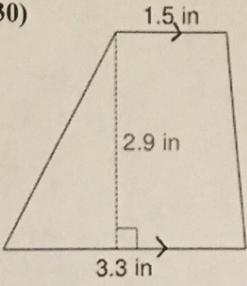


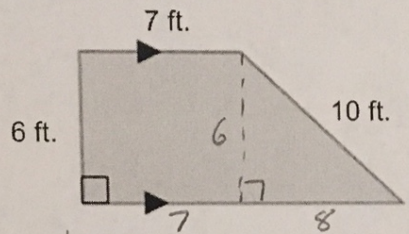
**Directions:** Put an X in the box if the quadrilateral always has the given property.

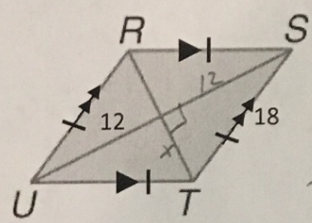
Property	Parallelogram	Rectangle	Rhombus	Square	Kite	Isosceles Trapezoid
16) Both pairs of opposite sides parallel	X	X	X	X		
17) Exactly one pair of sides parallel						X
18) Diagonals perpendicular			X	X	X	
19) Diagonals congruent		X		X		X
20) Diagonals bisect each other	X	X	X	X		
21) Diagonals bisect opposite angles			X	X		
22) Both pairs of opposite sides congruent	X	X	X	X		
23) Exactly one pair of opposite sides congruent						X
24) Two pairs of consecutive sides congruent but opposite sides not congruent					X	
25) Exactly two pairs of consecutive angles supplementary						X
26) Four pairs of consecutive angles supplementary	X	X	X	X		
27) All angles congruent		X		X		
28) Exactly one pair of opposite angles congruent					X	

Determine what type of quadrilateral is shown. Then find the area. Leave answers exact unless otherwise stated.

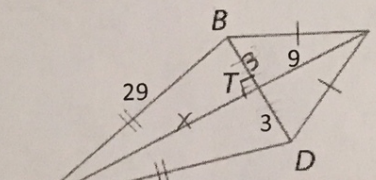
29)  *Parallelogram*  
 $A = bh$   
 $A = (9)(17)$   
 $A = 153 \text{ yd}^2$

30)  *Trapezoid*  
 $A = \frac{1}{2}h(b_1 + b_2)$   
 $A = \frac{1}{2}(2.9)(1.5 + 3.3)$   
 $A = \frac{1}{2}(2.9)(4.8)$   
 $A = 6.96 \text{ in}^2$

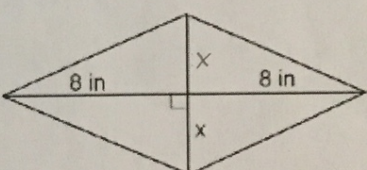
31)  *Trapezoid*  
 $A = \frac{1}{2}(h)(b_1 + b_2)$   
 $A = \frac{1}{2}(6)(7 + 8)$   
 $A = \frac{1}{2}(6)(15)$   
 $A = 45 \text{ ft}^2$

32)  *Rhombus*  
 $x^2 + 12^2 = 18^2$   
 $x^2 + 144 = 324$   
 $\sqrt{x^2} = \sqrt{180}$   
 $x = 6\sqrt{5}$   
 $A = \frac{1}{2}d_1d_2$   
 $A = \frac{1}{2}(24)(12\sqrt{5})$   
 $A = 144\sqrt{5} \text{ units}^2$

33) Round your answer to the nearest hundredth.

 *Kite*  
 $A = \frac{1}{2}d_1d_2$   
 $3^2 + x^2 = 29^2$   
 $9 + x^2 = 841$   
 $x^2 = 832$   
 $x = \sqrt{832}$   
 $x = \sqrt{64 \cdot 13}$   
 $x = 8\sqrt{13}$   
 $A = \frac{1}{2}(6)(9 + 8\sqrt{13})$   
 $A \approx 113.53 \text{ units}^2$

34) The area of the rhombus below is 32 square inches. Find the value of x.

  $32 = \frac{1}{2}(16)(2x)$   
 $32 = 16x$   
 $x = 2$

35) The area of the quadrilateral is 48 square feet. Find the value of x.

*Kite*  $A = \frac{1}{2}d_1d_2$   
 $48 = \frac{1}{2}(8)(x)$   
 $48 = 4x$   
 $x = 12$

