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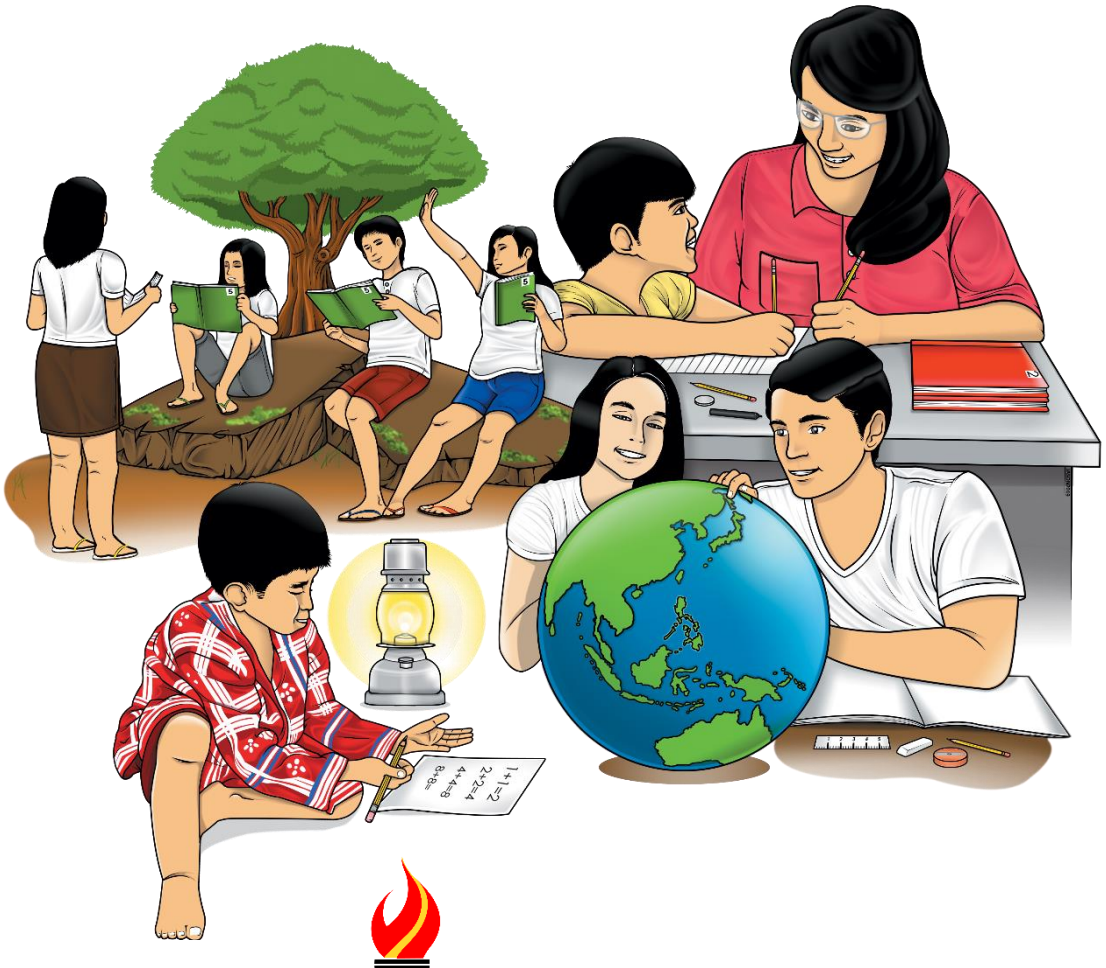
Mathematics

Quarter 3 – Module 8:
Problems Involving Parallelograms, Trapezoids and Kites



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ADM

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Alternative Delivery Mode
Quarter 3 – Module 8: Problems Involving Parallelograms, Trapezoids and Kites
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Mathematics

Quarter 3 – Module 8:

Problems Involving Parallelograms, Trapezoids and Kites

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

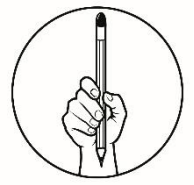
What I Need to Know

LEARNING COMPETENCY:

The learners will be able:

- solve problems involving parallelograms, trapezoids and kites

(**M9GE – IIIe – 35.1)**

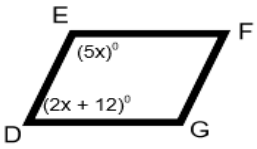


What I Know

Direction: Answer each of the following items. Write the letter of the correct answer.

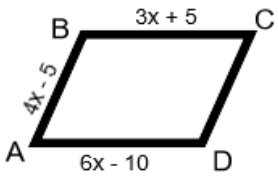
1.) If the diagonals of a quadrilateral are perpendicular bisectors of each other, then the quadrilateral is a _____.
a.) rectangle b.) rhombus c.) trapezoid d.) kite

2.) Given at the right is a parallelogram DEFG with indicated measures of its angle. Find the value of x.
a.) 20 b.) 22 c.) 24 d.) 26



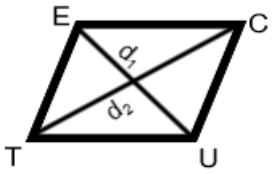
3.) Using the same figure in number 2, what is m∠F?
a.) 30^0 b.) 60^0 c.) 90^0 d.) 120^0

4.) In the figure at the right, ⊡ABCD is a parallelogram with |AB| = 4x – 5 cm, |BC| = 3x + 5 cm, and |AD| = 6x – 10 cm. Determine the length of $\overline{CD}$.
a.) 15 cm b.) 16 cm c.) 17 cm d.) 20 cm



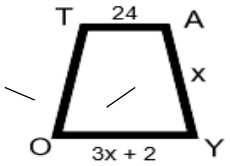
5.) Using the same figure in #4, if ⊡ABCD is a parallelogram, find its perimeter.
a.) 45 cm b.) 60 cm c.) 65 cm d.) 70 cm

6.) Given the diagonals of rhombus CUTE as d_1 and d_2 as shown in the figure at the right. If x = 4 units and d_1 = 2x + 3 units and d_2 = 5x – 1 units, find the area of the rhombus.



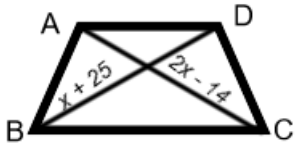
a.) 100.3 sq units b.) 101.2 sq units
c.) 102.4 sq units d.) 104.5 sq units

7.) ⊡TAYO is a trapezoid with the given lengths of its sides as shown in the figure at the right. If its perimeter is 86 cm, find the value of x.



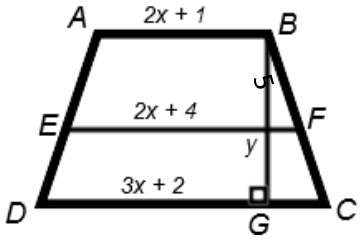
a.) 12 b.) 20 c.) 29 d.) 39

8.) Given isosceles trapezoid ABCD with the lengths of its diagonals as shown in the figure at the right, find the value of x.



a.) 11 b.) 25 c.) 39 d.) 41

9.) Isosceles trapezoid ABCD at the right has bases |AB| = 2x + 1 cm and |DC| = 3x + 2 cm, median |EF| = 2x + 4 cm, leg |BF| = 5 cm, and altitude |BG| = y. Find the length of its median $\overline{EF}$.



a.) 7 cm b.) 14 cm c.) 17 cm d.) 23 cm

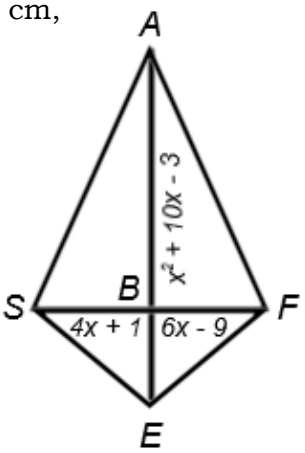
10.) From the same figure in #9, what is the length of $\overline{BC}$?

a.) 3 cm b.) 5 cm c.) 10 cm d.) 15 cm

11.) From the same given figure in #9, find its perimeter.

a.) 48 units b.) 56 units c.) 93 units d.) 106 units

12.) Given: ⊡SAFE is a kite. If |SB|= 4x + 1 cm, |FB|= 6x – 9 cm, and |AE| = x^2 + 10x – 3 as shown in the figure at the right. Find the value of x.



a.) 4 b.) 5 c.) 6 d.) 7

13.) From the same figure in #12, find the length of $\overline{SB}$.

a.) 21 cm b.) 25 cm c.) 32 cm d.) 37 cm

14.) From the same figure in #12, find the length of $\overline{AE}$.

a.) 25 cm b.) 56 cm c.) 69 cm d.) 72 cm

15.) From the same figure in #12, find its area.

a.) 756 sq cm b.) 1,512 sq cm c.) 3,150 sq cm d.) 6,048 sq cm

Lesson 1

PROBLEMS INVOLVING PARALLELOGRAMS, TRAPEZOIDS AND KITES

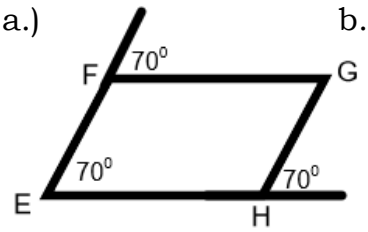
In the previous lessons, you have learned about the three types of quadrilaterals: the parallelogram, the trapezoid, and the kite. You have also learned about each of their properties. It is important that you remember those properties since they are useful in solving problems in Geometry.

What's In

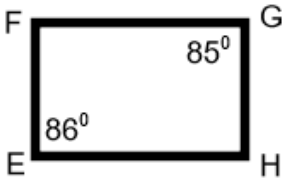
Answer the following:

1.) Given ⊡EFGH with some of its angular measures as shown. Can it be a parallelogram? Explain your answer.

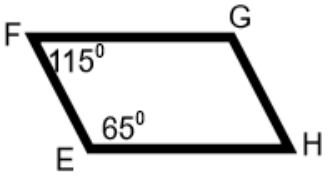
a.)



b.)

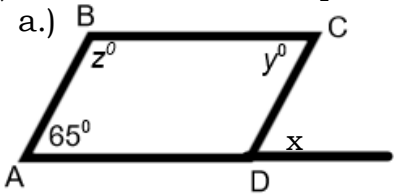


c.)

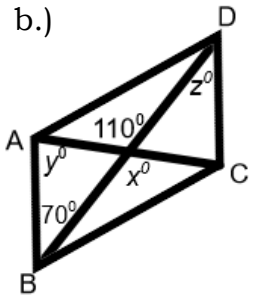


2.) Given ⊡ABCD is a parallelogram. Find the values of *x*, *y*, and *z*.

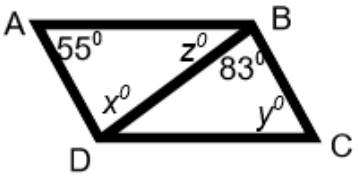
a.)



b.)

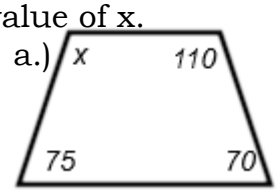


c.)

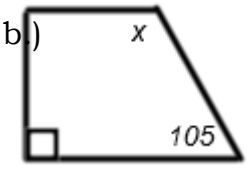


3.) Given below are trapezoids with indicated measures of angles. Find the value of x.

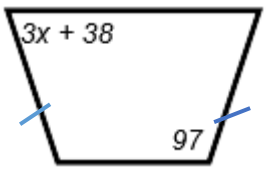
a.)



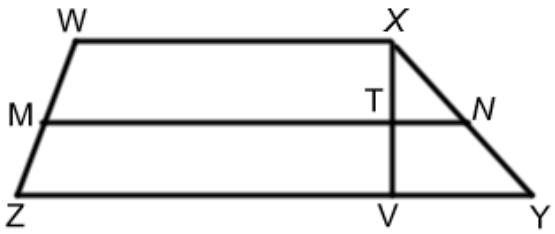
b.)



c.)



4.) Given at the right is trapezoid WXYZ with median $\overline{MN}$.

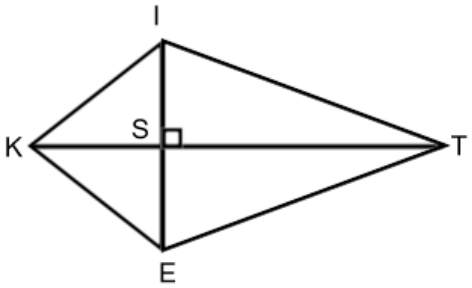


a.) If |YZ| = 42 cm and |MN| = 35 cm, then |WX| = _____.

b.) If |YV| = 9 cm, then |TN| = _____.

c.) If |WX| = 5j + 7k and |YZ| = 9j – 3k, then |MN| = _____.

5.) Given ⊡KITE on the adjacent figure is a kite.

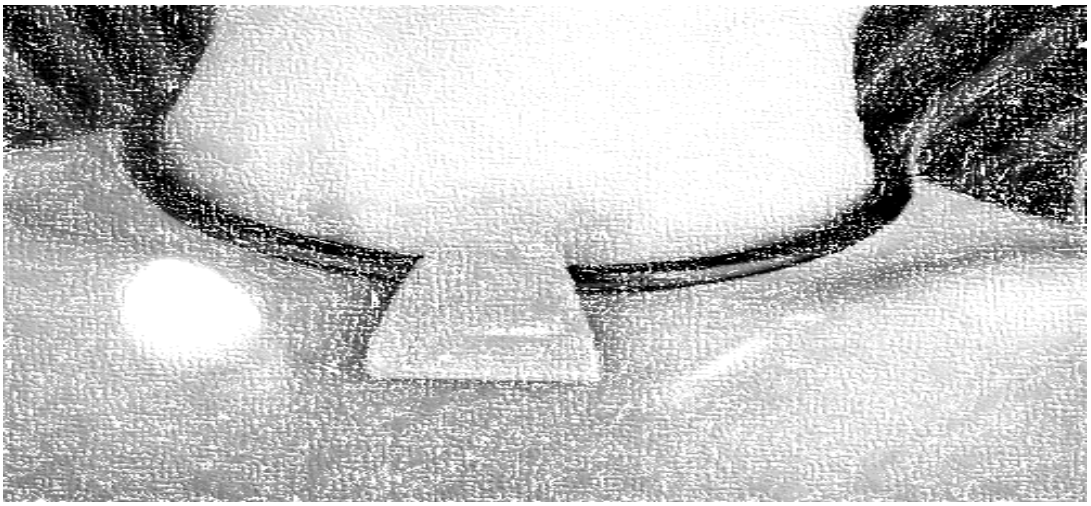


a.) If m∠KIS = 75^0 and m∠ITK = 30^0 then m∠KET = _____ and m∠IKT = _____.

b.) If |KI| = 7 cm and |IE| =13 cm, then |KE| = _____ and |SE| = _____.

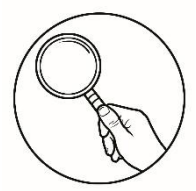
c.) If |IS| = 5 cm and |KT| = 15 cm, then the area of ⊡KITE = _____

What's New



Mariz, a senior high school student, is helping to raise money to buy relief goods for victims of COVID-19. Since Mariz is very artistic in making jewelry, she has decided to make and sell necklaces to raise money. Several customers have asked her what shape she has used for the blue bead of a

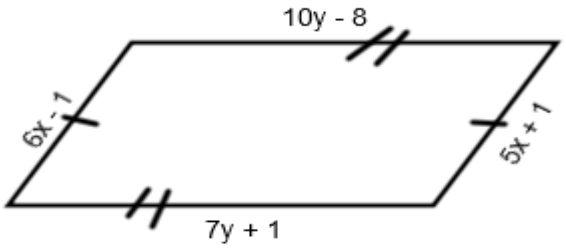
particularly geometric looking necklace. She knows what shape it is but is not sure of how to explain this shape to her customers. What can Mariz tell her customers about this shape?



What is It

Parallelogram

1.) Given the parallelogram at the right with indicated measures of its sides, solve for the values of x and y. Also, solve for the perimeter.



Solution:

Since the opposite sides of a parallelogram are congruent, then

$6x - 1 = 5x + 1$ $\quad\quad$ $7y + 1 = 10y - 8$

$\therefore$ **x = 2** $\quad\quad$ $-3y = -9$

$\therefore$ **y = 3**

Perimeter = sum of the measures of all sides.

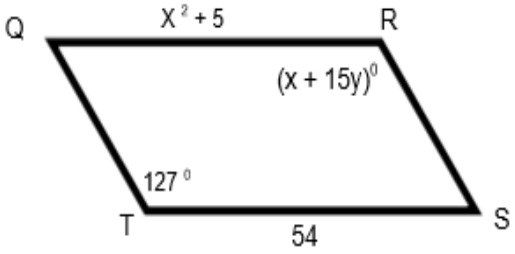
Substitute x and y by their respective values in the expressions representing the lengths of the sides. Thus

$6x - 1 = 6(2) - 1 = 12 - 1 = 11$ $\quad\quad$ $7y + 1 = 7(3) + 1 = 21 + 1 = 22$

$5x + 1 = 5(2) + 1 = 10 + 1 = 11$ $\quad\quad$ $10y - 8 = 10(3) - 8 = 30 - 8 = 22$

So, the perimeter = 11 + 11 + 22 + 22
= 66 units

2.) Given ⊡QRST is a parallelogram with the indicated measures of the sides and angles. Find the values of x and y.



Solution:

Given: |QR| = $x^2 + 5$ units; |ST| = 54 units

m∠T = 127^0; m∠R = x + 15y

Opposite sides of a parallelogram are congruent.

$|QR| = |ST|$

$x^2 + 5 = 54$

$x^2 = 54 - 5$

$x^2 = 49$

$x = \sqrt{49}$

$x = 7$

Opposite angles of a parallelogram are congruent.

$m\angle R = m\angle T$

$x + 15y = 127^0$

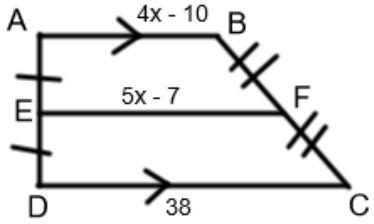
Since $x = 7$,

then $7 + 15y = 127^0$

$15y = 120$

$y = 8$

Trapezoid



A. Given the trapezoid ABCD at the right as marked. Find the lengths of the median and the upper base. Explain your answer.

Solution:

The figure has one pair of opposite parallel sides $\overline{AB}$ and $\overline{CD}$ which are the bases. $\overline{EF}$ is a median which connects the midpoints of the non parallel sides or legs. The length of the median is half the sum of the lengths of the two bases.

$|EF| = \frac{1}{2}(|AB| + |DC|)$

$5x - 7 = \frac{1}{2}[(4x - 10) + 38]$

$10x - 14 = 4x + 28$

$6x = 42$

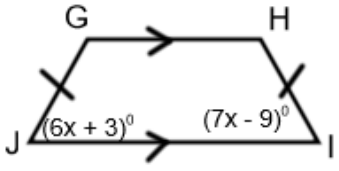
$x = 7$

By substitution:

Base: $|AB| = 4x - 10 = 4(7) - 10 = 28 - 10 = 18$ units

Median: $|EF| = 5x - 7 = 5(7) - 7 = 35 - 7 = 28$ units

B. Given the trapezoid GHIJ as marked, find the measures of the angles.



Solution:

Based on the markings, ⊡GHIJ is an isosceles trapezoid, therefore base angles are congruent.

$\angle J \cong \angle I$

$m\angle J = m\angle I$

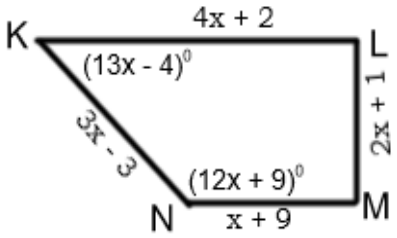
$6x + 3^0 = 7x - 9^0$

$x = 12^0$

Substitute x by its value in both equation:

$m\angle J = 6x + 3^0$	$m\angle I = 7x - 9^0$
$m\angle J = 6(12^0) + 3^0$	$m\angle I = 7(12^0) - 9^0$
$m\angle J = 72^0 + 3^0$	$m\angle I = 84^0 - 9^0$
$m\angle J = 75^0$	$m\angle I = 75^0$

C. Given trapezoid KLMN at the right with $\overline{KL}||\overline{MN}$. a.) If $m\angle K = 13x - 4^0$ and $m\angle N = 12x + 9^0$, find the measures of ∠K and ∠N.



b.) |KL| = 4x + 2 cm; |LM| = 2x + 1 cm; |MN| = x + 9 cm, and |KN| = 3x – 3 cm. Find the length of each side if the perimeter ⊡KLMN is 159 cm.

Solution:

a.) Since $\overline{KL}||\overline{MN}$, therefore ∠K and ∠N are supplementary.

$$m\angle K + m\angle N = 180^0$$
$$(13x - 4^0) + (12x + 9^0) = 180^0$$
$$25x = 175^0$$
$$x = 7^0$$

Substitute x by its value in both equations:

$m\angle K = 13x - 4^0$	$m\angle N = 12x + 9^0$
$m\angle K = 13(7^0) - 4^0$	$m\angle N = 12(7^0) + 9^0$
$m\angle K = 91^0 - 4^0$	$m\angle N = 84^0 + 9^0$
$m\angle K = 87^0$	$m\angle N = 93^0$

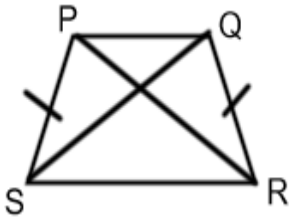
b.) Perimeter = |KL| + |LM| + |MN| + |KN|

$$159 = (4x + 2) + (2x + 1) + (x + 9) + (3x - 3)$$
$$159 = 10x + 9$$
$$10x = 159 - 9$$
$$10x = 150$$
$$x = 15 \text{ cm}$$

Substitute x by its value in all equations:

$\|KL\| = 4x + 2$	$\|LM\| = 2x + 1$	$\|MN\| = x + 9$	$\|KN\| = 3x - 3$
$\|KL\| = 4(15) + 2$	$\|LM\| = 2(15) + 1$	$\|MN\| = 15 + 9$	$\|KN\| = 3(15) - 3$
$\|KL\| = 60 + 2$	$\|LM\| = 30 + 1$	$\|MN\| = 24$ cm	$\|KN\| = 45 - 3$
$\|KL\| = 62$ cm	$\|LM\| = 31$ cm		$\|KN\| = 42$ cm

D. Given ⊡PQRS is a trapezoid at the right with $\overline{PS} \cong \overline{QR}$. If |PR| = 3x – 14 cm and |SQ| = 4x – 22 cm, find the length of the diagonals.



Solution:

If the given ⊡PQRS is an isosceles trapezoid, then its diagonals are congruent.

$\overline{PR} \cong \overline{SQ}$ → |PR| = |SQ|

3x – 14 = 4x – 22

x = 8

Substitute x by its value in both equations:

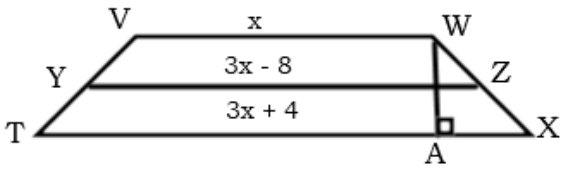
|PR| = 3x – 14	|SQ| = 4x – 22
|PR| = 3(8) – 14	|SQ| = 4(8) – 22
|PR| = 24 – 14	|SQ| = 32 – 22
|PR| = 10 cm	**|SQ| = 10 cm**

E. Given ⊡TVWX with $\overline{VW}$ // $\overline{TX}$, |VT| = |WX|, |YV| = |YT|, |ZW| = |ZX|, and $\overline{TX} \perp \overline{WA}$. If |VW| = x, |YZ| = 3x – 8 cm, |TX| = 3x + 4 cm, and |WX| = 13 cm, find the following:

a.) |YZ| (median)

b.) |WA| (height)

c.) Area



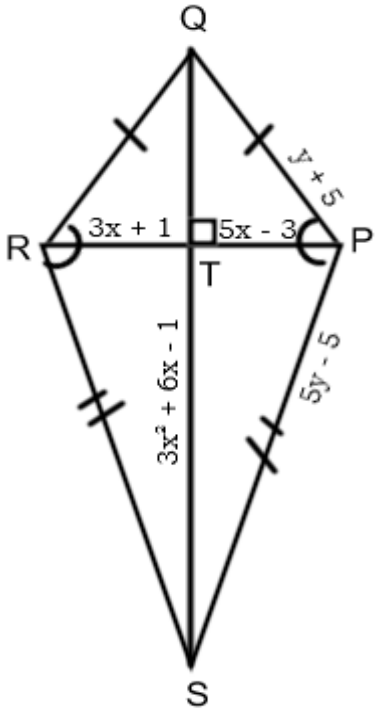
Solution:

Based on the given, ⊡TVWX is an isosceles trapezoid with median YZ.

Median	**Altitude/Height**		**Area**
$\|YZ\| = \frac{\|VW\|+\|TX\|}{2}$ $3x - 8 = \frac{x+3x+4}{2}$ 6x – 16 = 4x + 4 2x = 20 x = 10 cm |YZ| = 3x – 8 |YZ| = 3(10) – 8 |YZ| = 30 – 8 ***|YZ| = 22 cm***	In right ΔWAX, $\|WX\|^2 = \|WA\|^2 + \|AX\|^2$ $\|AX\| = \frac{\|TX\| - \|VW\|}{2}$ $\|AX\| = \frac{(3x+4)-(x)}{2}$ $\|AX\| = \frac{2x+4}{2} = x + 2$ $\|AX\| = 10 + 2$ $\|AX\| = 12$ cm	Pythagorean Formula $\|WX\|^2 = \|WA\|^2 + \|AX\|^2$ $(13)^2 = \|WA\|^2 + (12)^2$ $\|WA\|^2 = (13)^2 - (12)^2$ $\|WA\|^2 = 169 - 144$ $\|WA\|^2 = 25$ $\sqrt{\|WA\|^2} = \sqrt{25}$ ***|WA| = 5 cm***	Area of a trapezoid is equal to the product of the length of the median and the height. $A = mh$ $A = \|YZ\|\|WA\|$ $A = (22)(5)$ $\boldsymbol{A = 110\ cm^2}$

Kite

1.) Given the ⊡PQRS as marked and with perimeter of 60 cm.
   a. Find the value of y and the length of each side if |QP| = y + 5 cm and |PS| = 5y – 5 cm.
   b. If |RT| = 3x + 1 cm, |PT| = 5x – 3 cm, and |QS| = $3x^2 + 6x – 1$ cm, find the value of x and the lengths of $\overline{PT}$, $\overline{RT}$, and $\overline{SQ}$.
   c.) Find the area of the figure.



Solution:

a.) Based on the markings, the figure is a kite.
|QP| = |QR| and |RS| = |PS|.
Perimeter = sum of the lengths of the sides.

$$P = 2|QP| + 2|PS|$$
60 = 2(y + 5) + 2(5y – 5)
60 = 2y + 10 + 10y – 10
60 = 12y
y = 5

Substitute y by its value in both equations:

|QP|=|QR|= y + 5	|RS|=|PS|= 5y – 5
|QP|=|QR|= 5 + 5	|RS|=|PS|= 5(5) – 5
|QP|=|QR|= 10 cm	|RS|=|PS|= 25 – 5
	|RS|=|PS|= 20 cm

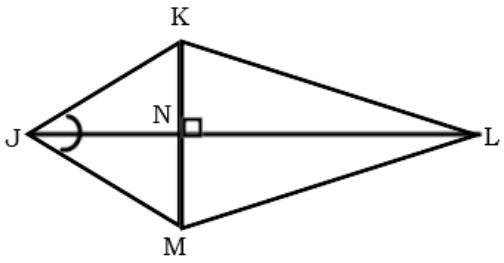
b.) |RT| = |PT|
3x + 1 = 5x – 3
2x = 4
x = 2

Substitute x by its value in the three equations:

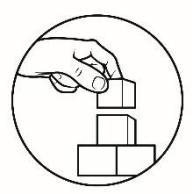
|RT| = 3x + 1	|PT| = 5x – 3	|QS| = $3x^2 + 6x – 1$
|RT| = 3(2) + 1	|PT| = 5(2) – 3	|QS| = $3(2)^2 + 6(2) – 1$
|RT| = 6 + 1	|PT| = 10 – 3	|QS| = 3(4) + 12 – 1
|RT| = 7 cm	**|PT| = 7 cm**	|QS| = 12 + 11
		|QS| = 23 cm

c.) Area of kite = ½ d_1d_2
A = ½ |RP||QS|
A = ½ (14)(23)
A = 161 cm^2

2. Given ⊡JKLM is a kite. If m∠MJK = 70^0, and m∠MKL = 65^0, find the measures of the other angles.



Answer:
$\overline{JL}$ is the ⊥ bisector of $\overline{KM}$, m∠JNK = m∠JNM = m∠MNL = m∠KNL = 90^0.
ΔMJK is isosceles and opposite angles of congruent sides are congruent. If m∠MJK = 70^0, then m∠JKM = m ∠JMK = 55^0 making m∠KJL = m∠MJL = 35^0
If m∠MKL = 65^0, then m∠KML = 65^0 ,making m∠JKL = m∠JML = 120^0.
Since ΔKNL is a right triangle, then m∠KLN = m∠MLN = 25^0, making m∠KLM = 50^0.



What's More

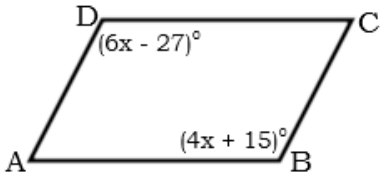
Activity 1:

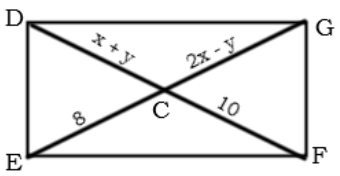
Solve the following.

1.) The diagonals of a rhombus measure 15 cm and 20 cm. What is the area of the rhombus?

2.) The area of a rhombus is 348 cm^2 and one diagonal measures 24 cm. Find the measure of the other diagonal.

3.) Given ⊡ABCD below is a parallelogram with m∠B = 4x + 15^0 and m∠D = 6x – 27^0. Find the measures of the four angles.





4.) Given ⊡DEFG above right is a parallelogram with diagonals $\overline{DF}$ and $\overline{EG}$ that intersect at C. If |DC| = x + y, |CF| = 10 cm, |EC| = 8 cm, and |CG| = 2x – y, find the values of x and y, and the lengths of diagonals $\overline{DF}$ and $\overline{EG}$.

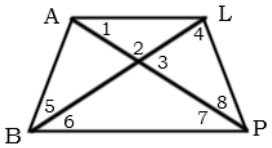
Activity 2:

Solve the following.

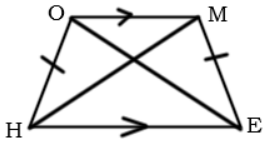
1.) Complete the table by finding the unknown length for each part of a trapezoid.

One Base	Other Base	Median
9	4 ½	_____
_____	12.5	20
12 + 3x	16 – 3x	_____

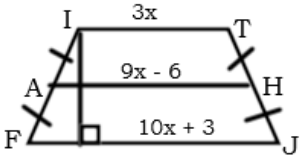
2.) In the isosceles trapezoid BALP below, m∠BAP = 98^0 and m∠BLA = 26^0. Find the measure of each numbered angle.



3.) Given ⊡ $HOME$ below as marked with |HM| = 10x + 1 cm and |OE|= 9x + 3, find the length of each diagonal.



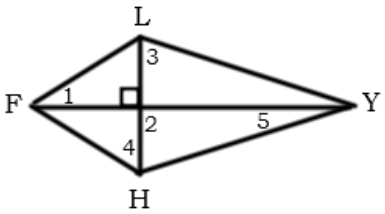
4.) ⊡ FITJ below is an isosceles trapezoid with |IT| = 3x, |AH| = 9x – 6 cm, |FJ| = 10x + 3 cm, and |TJ| = 15 cm. Find its perimeter. If the altitude is 9 cm, find its area.



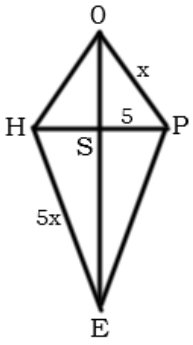
Activity 3:

Solve the following.

1.) The given figure below is kite FLYH with m∠HFL = 80^0 and m∠FLY = 103^0. Find the measures of the numbered angles.



2.) ⊡HOPE below is a kite with |OP| = x, |HE| = 5x, and |SP| = 5 cm. If the perimeter is 108 cm, find the value of x and the lengths of $\overline{HS}$, $\overline{PE}$, and $\overline{OH}$.



What I Have Learned

Parallelogram

To solve problems involving parallelogram, one must know its properties.

1. Opposite sides are parallel and congruent.
2. Opposite angles are congruent
3. Consecutive angles are supplementary
4. Diagonal divides the parallelogram into 2 congruent triangles
5. Diagonals bisect each other
6. The area of the rhombus is equal to one-half the product of the lengths of the diagonals.

Trapezoid

Trapezoid is a quadrilateral with exactly one pair of parallel sides called bases. The non-parallel sides are called legs. If a lower base angle and an upper base angle have a common side, then those angles are supplementary.

Isosceles Trapezoid is a trapezoid with congruent legs, congruent lower base angles, congruent upper base angles. Any lower base angle is supplementary to any upper base angle.

1. The median of the trapezoid $=\frac{b_1+b_2}{2}$
2. Perimeter of trapezoid = a + b + c + d
3. Area of a trapezoid = median * height

Kite

A kite is a quadrilateral in which two distinct pairs of consecutive sides are congruent.

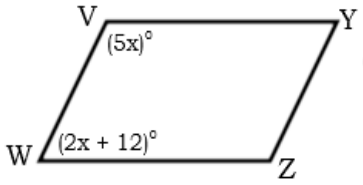
The diagonals are perpendicular. One diagonal is the perpendicular bisector of the other. One diagonal bisects a pair of opposite angles. One angle formed by the non-congruent sides is congruent to the opposite angle.

The area of the kite =.

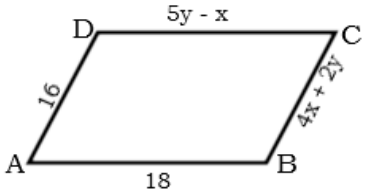
What I Can Do

Solve each of the following prolems using the accompanying figure.

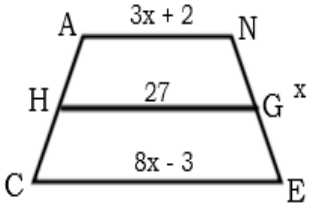
1.) The figure below is parallelogram VYZW with m∠V = 5x and m∠W = 2x + 12^0. Find the value of x, m∠Z, and m∠Y.



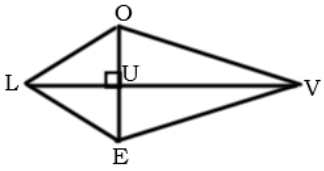
2.) ⊡ABCD below is a parallelogram with |DC| = 5y – x, |BC| = 4x + 2y, |AB| = 18 cm, and |AD| = 16 cm. a) Find the values of x and y. b) What is its perimeter?



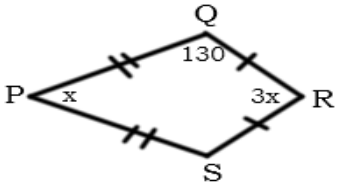
3.) ⊡ACEN below is an isosceles trapezoid with |AN| = 3x + 2 cm, |CE| = 8x – 3 cm, |NE| = x, and median |HG| = 27 cm. a) Determine the value of x, and b) find its perimeter.



4.) The given quadrilateral below is a kite with |LV| = 3x and |OE| = x. If its area is 6 sq units, a) find the value of x, and b) determine the length of $\overline{OU}$.

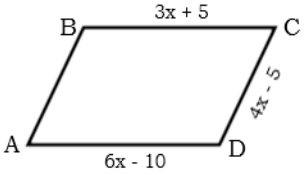


5.) ⊡PQRS is a kite with m∠Q = 130^0, m∠P = x, and m∠R = 3x. Determine the value of x and find the measure of ∠P, ∠R, and ∠S.



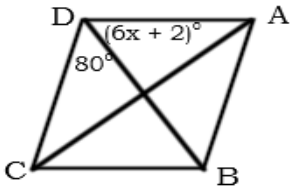
Assessment

Direction: Read ad answer each item accurately. Encircle the letter of the best answer.



1.) ⊡ABCD at the right is a parallelogram with |BC| = 3x + 5 cm, |DC| = 4x – 5 cm, and |AD| = 6x – 10 cm. Determine the length of $\overline{BC}$.
a.) 5 cm b.) 11 cm c.) 15 cm d.) 20 cm

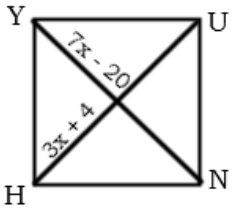
2.) From the same figure in #1, what is the perimeter of the parallelogram?
a.) 50 cm b.) 60 cm c.) 70 cm d.) 80 cm



3.) ⊡CDAB at the right is a rhombus with m∠ADB = 6x + 2^0 and m∠BDC = 80^0. What is the value of x?
a.) 9 b.) 13 c.) 23 d.) 25

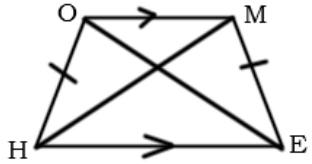
4.) From the same figure in #3, what is m∠ABC?
a.) 80^0 b.) 100^0 c.) 160^0 d.) 163^0

5.) ⊡HYUN at the right is a square with diagonal |YN| = 7x – 20 cm and |HU| = 3x + 4 cm. Find the value of x.
a.) 3 b.) 5 c.) 6 d.) 9



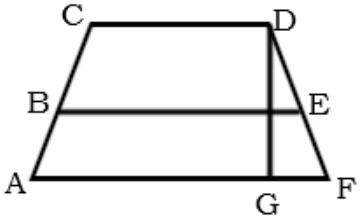
6.) From the same figure in #5, what is the area in cm^2?
a.) 242 b.) 280 c.) 363 d.) 484

7.) ⊡HOME at the right is an isosceles trapezoid with |ME| = 3x + 7 cm and |OH| = 4x – 5 cm. What is the length of $\overline{ME}$?
a.) 40 cm b.) 43 cm c.) 49 cm d.) 51 cm



8.) From the same figure in #7, if |OE| = 5y + 13 cm and |HM| = 7y – 9 cm, find the length of $\overline{OE}$.
a.) 11 cm b.) 38 cm c.) 67 cm d.) 68 cm

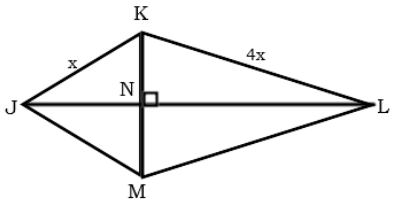
9.) Given isosceles trapezoid ACDF at the right, with |CD| = 6x – 6 cm and |AF| = 9x – 3 cm, find the length of median $\overline{BE}$ if x = 5 cm.
a.) 24 cm b.) 33 cm c.) 42 cm d.) 75 cm



10.) From the same figure in #9, what is the length of FG?
a.) 7 cm b.) 9 cm c.) 12 cm d.)24 cm

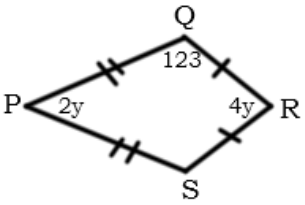
11.) Using the same figure in #9, find the area of the trapezoid if |DG| = 40 cm.
a.) 1230 cm^2 b.) 1320 cm^2 c.) 2130 cm^2 d.) 3120 cm^2

12.) The figure at the right is a kite with |JK| = x and |KL| = 4x. If the perimeter is equal to 160 m, find the value of x.
a.) 8 b.) 16 c.) 18 d.) 19



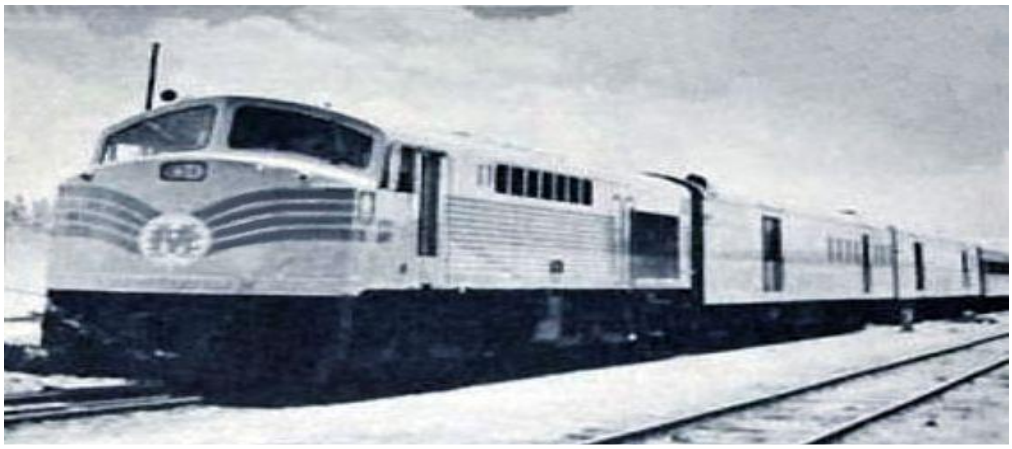
13.) From the same figure in #12, find |JM|.
a.) 128 m b.) 64 m c.) 16 m d.) 8 m

14.) The figure at the right is kite PQRS with m∠Q = 123^0, m∠P = 2y and m∠R = 4y. Find the value of y.
a.) 19 b.) 18 c.) 12 d.) 6



15.) From the same figure in #14, find m∠R.
a.) 6 b.) 19 c.) 38 d.) 76

Additional Activities



The railway sector has geared up to serve commuters while observing health protocols on public transport once the enhanced community quarantine (ECQ) is lifted in Metro Manila.

In MRT alone, it is estimated that only 158 passengers are allowed per trip or 43 persons per cabin (which is parallelogram in shape) in compliance of social distancing.

What do you think are the advantages and disadvantages of the different protocols set by the DOTr in the use of the railways amidst Covid 19?

_____
_____
_____

Answer Key

What I know

1.) B	6.) D	11.) A
2.) C	7.) A	12.) B
3.) B	8.) C	13.) A
4.) A	9.) B	14.) D
5.) D	10.) C	15.) B

What's In

1.) a.) Yes because opposite sides are parallel.
b.) No because opposite angles are not congruent.
c.) Yes because consecutive angles are supplementary.

2.)
a.) $x = 65; y = 65 ; z = 115$
b.) $x = 110; y = 40; z = 70$
c.) $x = 83; y = 55; z = 42$

3.) a.) 105; b.) 75; c.) 15

4.) a.) 28; b.) 4.5; c.) 7j + 2k

5.)
a.) $m\angle KET = 135; m\angle IKT = 15$
b.) KE = 7; SE = 6.5
c.) 75 cm^2

What's More

Activity 1

1.) 150 sq units
2.) 29 units
3. $m\angle A = m\angle C = 81$; $m\angle B = m\angle D = 99$
4. $x=6; y=4$; DF=20 ; EG=16

Activity 2

1.) a.) 6.75 b.)27.5 c.) 14
2.) $m\angle 1=m\angle 6=m\angle 7 = 26$; $m\angle 5=m\angle 8 = 30$; $m\angle 2 = 128$; $m\angle 4 = 98$; $m\angle 3= 52$
3.) 21
4.) Perimeter = 72 units; Area = 189 sq units

Activity 3

1.) $m\angle 1 = 40$; $m\angle 2 = 90$; $m\angle 3 = 53$; $m\angle 4 = 50$; $m\angle 5 = 37$
2.) $x = 9$; HS = 5 ; PE = 45 ; OH = 9

What I Can Do

1.) $x = 24$; $m\angle z = 120$; $m\angle y = 60$
2.) $x = 2$; $y = 4$; Perimeter = 68 units
3.) $x = 5$; Perimeter = 64 units
4.) $x = 2$; OU = 1 unit
5.) $x = 25$; $m\angle P = 25$; $m\angle R = 75$; $m\angle S = 130$

Assessment Test

1.) D	6.) A	11.) B
2.) C	7.) B	12.) B
3.) B	8.) D	13.) C
4.) C	9.) B	14.) A
5.) C	10.) B	15.) D

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E-SITES

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