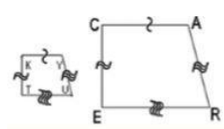
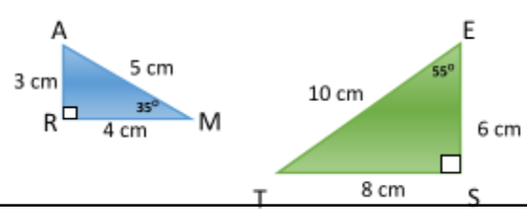
DAILY LESSON LOG OF M9GE–III–h–1 (DAY ONE)

School		**Grade Level**	Grade 9
Teacher		**Learning Area**	Mathematics
Teaching Date and Time		**Quarter**	Third

I. OBJECTIVES	*Objectives must be met over the week and connected to the curriculum standards. To meet the objectives, necessary procedures must be followed and if needed, additional lessons, exercises and remedial activities may be done for developing content knowledge and competencies. These are assessed using Formative Assessment Strategies. Valuing objectives support the learning of content and competencies and enable children to find significance and joy in learning the lessons. Weekly objectives shall be derived from the curriculum guides.*
A. Content Standards	The learner demonstrates understanding of key concepts of parallelograms and triangle similarity.
B. Performance Standards	The learner is able to investigate, analyze, and solve problems involving parallelograms and triangle similarity through appropriate and accurate representation.
C. Learning Competencies/ Objectives	Learning Competency: Proves the conditions for similarity of triangles by SSS similarity Theorem. (M9GE–III–h–1) 1. Identify the corresponding angles and corresponding sides. 2. Prove the conditions for similarity of triangles using the SSS similarity theorem. 3. Shows interest in doing the tasks.
II. CONTENT	**Proves the Conditions for Similarity of Triangles by SSS Similarity Theorem**
III. LEARNING RESOURCES	
A. References	
1. Teacher's Guide pages	Pages 243-244
2. Learner's Materials pages	Pages 371-373
3. Textbook pages	e-math by O. Oronce and M. Mendoza pages 302-317
4. Additional Materials from Learning Resource (LR) portal	
B. Other Learning Resources	Activity Sheets for Dependent Learning and Worksheet for Independent Learning
IV. PROCEDURES	*These steps should be done across the week. Spread out the activities appropriately so that pupils/students will learn well. Always be guided by demonstration of learning by the pupils/ students which you can infer from formative assessment activities. Sustain learning systematically by providing pupils/students with multiple ways to learn new things, practice the learning, question their learning processes, and draw conclusions about what they learned in relation to their life experiences and previous knowledge. Indicate the time allotment for each step.*
A. Review previous lesson or presenting the new lesson	As a review, the teacher asks the students the following questions below: 1. When do polygons become similar? If the corresponding sides are proportional and corresponding angles are congruent. 2. Give an illustration of similar polygons. Answers of the students may vary. 
B. Establishing a purpose for the lesson	● The teacher lets the students realize that proving the conditions for similarity of triangles is important skill in understanding each similarity theorems.
C. Presenting examples/ instances of the new lesson	● The teacher lets the students, in groups of three, do the activity below and asks the students to answer the guide questions that follow. Given the figure below, verify if the two triangles are similar. 

Guide Questions:

1. Complete the table below.

Parts of the Triangle	ΔARM	ΔEST
Length of longest side		
Length of shortest side		
Length of Remaining Side		
Measure of largest angle		
Measure of smallest angle		
Measure of remaining angle		

2. What is the measure of the angles of ΔARM? How about ΔEST?

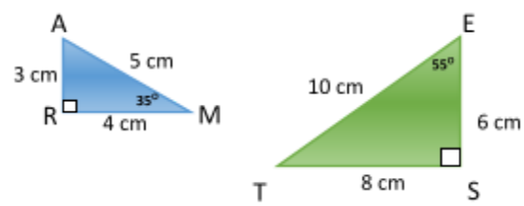
$m\angle A =$ _____ $m\angle R =$ _____ $m\angle M =$ _____

$m\angle E =$ _____ $m\angle S =$ _____ $m\angle T =$ _____

3. What angle of ΔEST congruent to $m\angle A$? Congruent to $m\angle R$? Congruent to $m\angle M$?
4. What can you say about the measures of the three angles of ΔARM to the measure the three angles of ΔEST?
5. What is the ratio between the longest side of ΔARM to the longest side ΔEST? How about the shortest side of ΔARM to the shortest side of ΔEST? How about the remaining side of ΔARM to the remaining side of ΔEST?
6. Compare the ratio of the corresponding sides of the two triangle. What can you say about ratio of the corresponding sides?

Answer Key:

Given the figure below, verify if the two triangles are similar.



Guide Questions:

1. Complete the table below.

Parts of the Triangle	ΔARM	ΔEST
Length of longest side	5 cm	10 cm
Length of shortest side	3 cm	6 cm
Length of remaining Side	4 cm	8 cm
Measure of largest angle	90°	90°
Measure of smallest angle	35°	35°
Measure of remaining angle	55°	55°

2. What is the measure of the angles of ΔARM? How about ΔEST?

$m\angle A = 55^o$ $m\angle R = 90^o$ $m\angle M = 35^o$

$m\angle E = 55^o$ $m\angle S = 90^o$ $m\angle T = 35^o$

3. What angle of ΔEST congruent to $m\angle A$? Congruent to $m\angle R$? Congruent to $m\angle M$?

$\angle A \cong \angle E$ $\angle R \cong \angle S$ $\angle M \cong \angle T$

4. What can you say about the measures of the three angles of ΔARM to the measure the three angles of ΔEST?

Corresponding angles are congruent.

5. What is the ratio between the longest side of ΔARM to the longest side ΔEST? How about the shortest side of ΔARM to the shortest side of ΔEST? How about the remaining side of ΔARM to the remaining side of ΔEST?

$\frac{AR}{ES} = \frac{3\ cm}{6\ cm} = \frac{1}{2}$ $\frac{RM}{ST} = \frac{4\ cm}{8\ cm} = \frac{1}{2}$ $\frac{AM}{ET} = \frac{5\ cm}{10\ cm} = \frac{1}{2}$

6. Compare the ratio of the corresponding sides of the two triangle. What can you say about ratio of the corresponding sides?

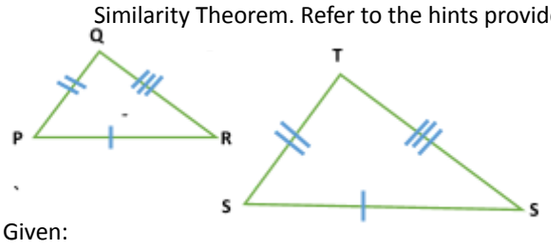
Corresponding sides are proportional.

D. Discussing new concepts and practicing new skills #1	• The teacher discusses with the students the process of arriving at the answer of each item using the guide questions. Furthermore, the teacher asks the students about the mathematical skills or principles that they used in proving the conditions for similarity of triangles using the SSS similarity theorem.
E. Discussing new concepts and practicing new skills #2	• Working in pairs, the teacher gives another activity for the students to perform. This will allow the students to demonstrate learning.

Activity 9

SSS Similarity Theorem and Its Proof

Write the statements or reasons that are left blank in the proof of SSS Similarity Theorem. Refer to the hints provided to help you.



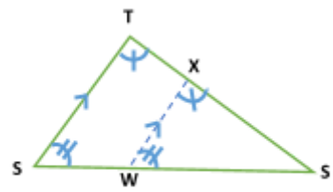
Given:

$$\frac{PQ}{ST} = \frac{QR}{TU} = \frac{PR}{SU}$$

Prove:

$\triangle PQR \sim \triangle STU$

Proof:



- Construct X on $\overline{TU}$ such that $\overline{XU} \cong \overline{QR}$.
- From X, construct $\overline{XW}$ parallel to $\overline{TS}$ intersecting $\overline{SU}$ at W.

	Hint	Statement	Reason
1	Which sides are parallel by construction?		By construction
2	Describe angles WXU and STU and XWU and TSU based on statement 1.		Corresponding angles are congruent.
3	Are WXU and STU similar?		_____ Similarity Theorem
4	Write the equal ratios of similar triangles in statement 3?		Definition of similar polygons
5	Write the given.		Given
6	Write the congruent sides that resulted from construction.		By construction
7	Use statement 6 in statement 5.		Substitution
8	If $\frac{PQ}{ST} = \frac{XU}{TU}$ $(statement\ 7)$ and $\frac{WX}{ST} = \frac{XU}{TU}(statement\ 4)$, then		Transitive Property of Equality
	If $\frac{XU}{TU} = \frac{PR}{SU}$ $(statement\ 7)$ and $\frac{XU}{TU} = \frac{WU}{SU}(statement\ 4)$, then		
9	Multiply the proportions in stamen 8 by their common denominators and simplify.		Multiplication Property of Equality
10	Are triangles PQR and WXU congruent? Base your answer from statements 9 and 6.		SSS Triangle Congruence Postulate
11	Use statement 10 to describe angles WXU and SUT.		Definition of Congruent triangles
12	Substitute the denominators of statement 4 using the equivalents in statements 9 and 6, then simplify.	— = — = — =?	Substitution
13	Using statements2, 11 and 12, what can you say about triangles PQR and WXU?		Definition of Similar Polygons
14	Write a conclusions using statements 13 and 3.		Transitivity

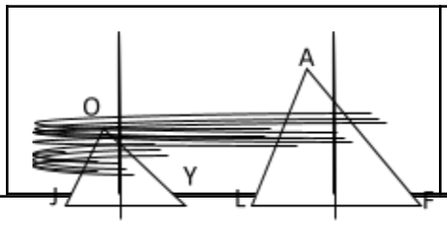
Answer Key:

	Hint	Statement	Reason
1	Which sides are parallel by construction?	$\overline{XW} \parallel \overline{ST}$	By construction
2	Describe angles WXU and STU and XWU and TSU based on statement 1.	$\angle WXU \cong \angle STU$ $\angle XWU \cong \angle TSU$	Corresponding angles are congruent.
3	Are WXU and STU similar?	$\Delta WXU \sim \Delta STU$	_____ Similarity Theorem
4	Write the equal ratios of similar triangles in statement 3?	$\frac{WX}{ST} = \frac{XU}{TU} = \frac{WU}{SU}$	Definition of similar polygons
5	Write the given.	$\overline{XW} \parallel \overline{ST}$	Given
6	Write the congruent sides that resulted from construction.	$\overline{XU} \cong \overline{QR}$	By construction
7	Use statement 6 in statement 5.	$\frac{PQ}{ST} = \frac{XU}{TU} = \frac{PR}{SU}$	Substitution
8	If $\frac{PQ}{ST} = \frac{XU}{TU}$ $(statement\ 7)$ and $\frac{WX}{ST} = \frac{XU}{TU}(statement\ 4)$, then If $\frac{XU}{TU} = \frac{PR}{SU}$ $(statement\ 7)$ and $\frac{XU}{TU} = \frac{WU}{SU}(statement\ 4)$, then	$\frac{PQ}{ST} = \frac{WX}{ST}$; $\frac{PR}{SU} = \frac{WU}{SU}$	Transitive Property of Equality
9	Multiply the proportions in statement 8 by their common denominators and simplify.	$\overline{PQ} = \overline{WX}$; $\overline{PR} = \overline{WU}$	Multiplication Property of Equality
10	Are triangles PQR and WXU congruent? Base your answer from statements 9 and 6.	$\Delta PQR \cong \Delta WXU$	SSS Triangle Congruence Postulate
11	Use statement 10 to describe angles WXU and SUT.	$\Delta WUX \cong \Delta SUT$	Definition of Congruent triangles
12	Substitute the denominators of statement 4 using the equivalents in statements 9 and 6, then simplify.	$\frac{WX}{WX} = \frac{XU}{XU} = \frac{WU}{WU} = 1$	Substitution
13	Using statements2, 11 and 12, what can you say about triangles PQR and WXU?	$\Delta PQR \sim \Delta WXU$	Definition of Similar Polygons
14	Write a conclusions using statements 13 and 3.	$\Delta PQR \sim \Delta STU$	Transitivity

F. Developing mastery (leads to formative assessment 3)

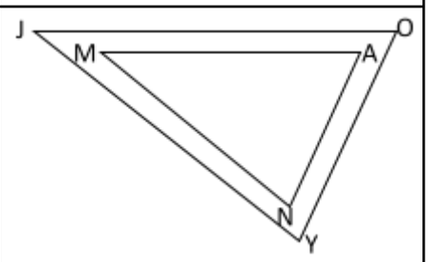
- The teacher gives another activity for the students to perform individually. This will allow the students to demonstrate learning.

Use the SSS Similarity Theorem in writing an If-then statement to describe an illustration or in completing a figure based on an if-then statement.

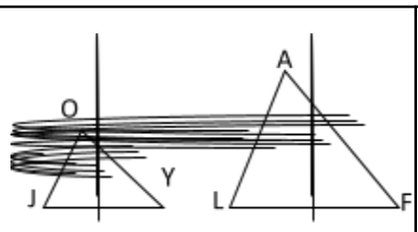


If:	
Then:	

If:	$\frac{OY}{AN} = \frac{OJ}{AM} = \frac{JY}{MN}$
Then:	ΔJOY ~ΔMAN

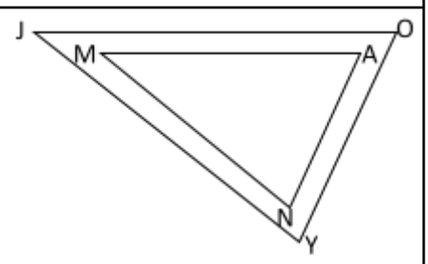


Answer Key:



If:	$\frac{JY}{LF} = \frac{JO}{LA} = \frac{OY}{AF}$
Then:	ΔYJO ~ΔFLA

If:	$\frac{OY}{AN} = \frac{OJ}{AM} = \frac{JY}{MN}$
Then:	ΔJOY ~ΔMAN



G. Finding practical applications of concepts and skills in daily living

H. Making generalizations and abstractions about the lesson

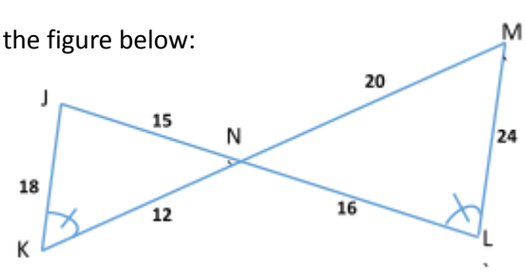
- The teacher summarizes the mathematical skills or principles used to prove conditions for similar triangles by SSS similarity theorem by asking the following question like:
  1. How does the ratio of the corresponding sides of two similar triangles related in SSS similarity theorem?
     Corresponding sides of two similar triangles are proportional.
- Answers can be drawn from the students.

I. Evaluating Learning

- The teacher lets the students answer individually the formative assessment.

Complete the following using the figure below:

1. $\Delta JKN \sim$ _____
2. $\angle NML \cong$ _____
3. $\frac{JN}{MN} = \frac{KN}{?} = \frac{?}{LM}$
4. $\frac{15}{?} = \frac{18}{?} = \frac{12}{?}$



Answer Key:

1. $\Delta JKN \sim \Delta MLN$
2. $\angle NML \cong \angle NJK$

	3. $\frac{JN}{MN} = \frac{KN}{LN} = \frac{KJ}{LM}$ 4. $\frac{15}{20} = \frac{18}{24} = \frac{12}{16}$
1. Additional activities or remediation	
V. REMARKS	
VI. REFLECTION	*Reflect on your teaching and assess yourself as a teacher. Think about your students' progress. What works? What else needs to be done to help the pupils/students learn? Identify what help your instructional supervisors can provide for you so when you meet them, you can ask them relevant questions.*
A. No. of learners who earned 80% of the evaluation	
B. No. of learners who require additional activities for remediation who scored below 80%	
C. Did the remedial lesson work? No. of learners who have caught up with the lesson.	
D. No. of learners who continue to require remediation	
E. Which of my teaching strategies worked well? Why did these work?	
F. What difficulties did I encounter which my principal or supervisor can help me solve?	
G. What innovation or localized materials did I use/ discover which I wish to share with other teachers	

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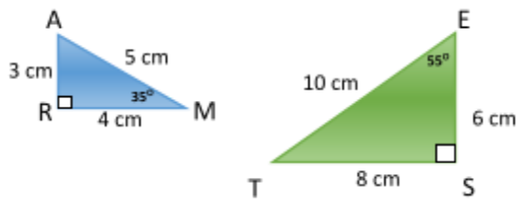

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3. What angle of ΔEST congruent to $m\angle A$? Congruent to $m\angle R$? Congruent to $m\angle M$?
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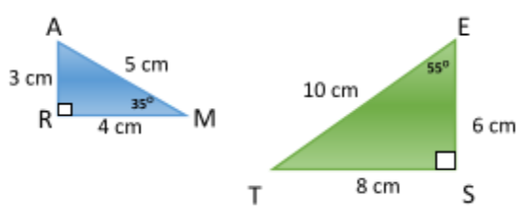

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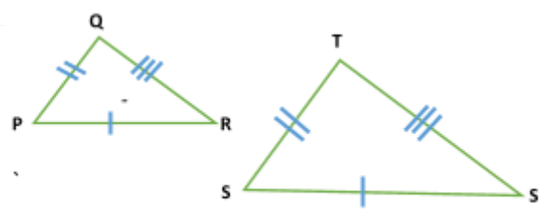

Given:

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Prove:

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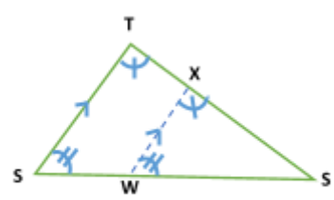

Proof:

- Construct X on $\overline{TU}$ such that $\overline{XU} \cong \overline{QR}$.
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	Hint	Statement	Reason
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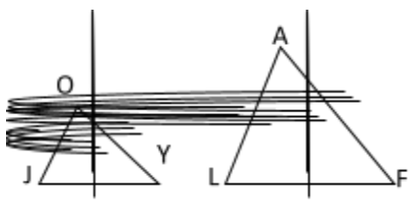
Use the SSS Similarity Theorem in writing an If-then statement to describe an illustration or in completing a figure based on an if-then statement.



If:	
Then:	

If:	$\frac{OY}{AN} = \frac{OJ}{AM} = \frac{JY}{MN}$
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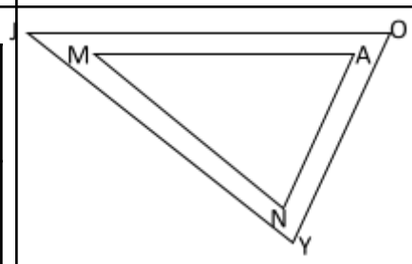

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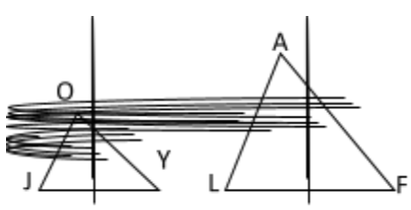

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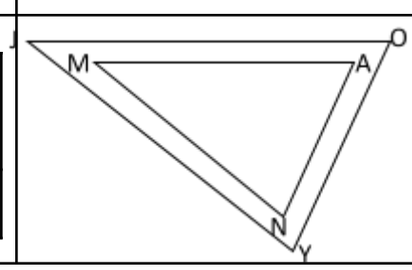

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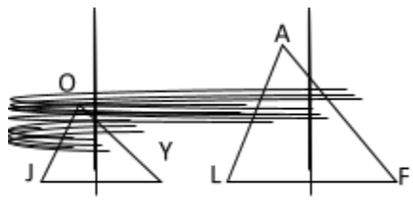
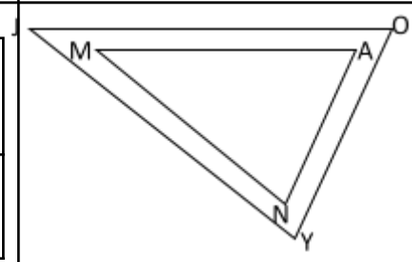
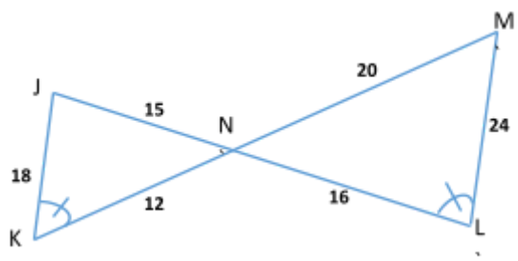
	If: Then:
If: $\frac{OY}{AN} = \frac{OJ}{AM} = \frac{JY}{MN}$ Then: $\Delta JOY \sim \Delta MAN$	

Complete the following using the figure below:

1. $\Delta JKN \sim$ _____
2. $\angle NML \cong$ _____
3. $\frac{JN}{MN} = \frac{KN}{?} = \frac{?}{LM}$
4. $\frac{15}{?} = \frac{18}{?} = \frac{12}{?}$



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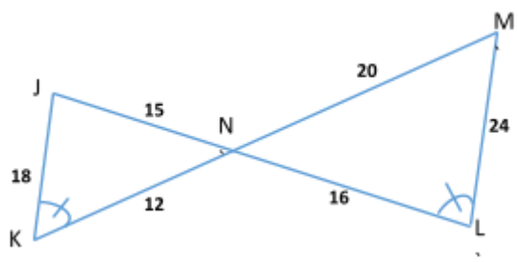
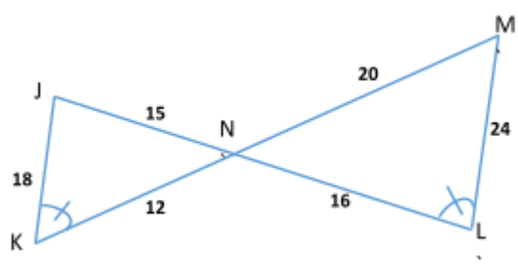


Complete the following using the figure below:

1. $\Delta JKN \sim$ _____
2. $\angle NML \cong$ _____
3. $\frac{JN}{MN} = \frac{KN}{?} = \frac{?}{LM}$
4. $\frac{15}{?} = \frac{18}{?} = \frac{12}{?}$



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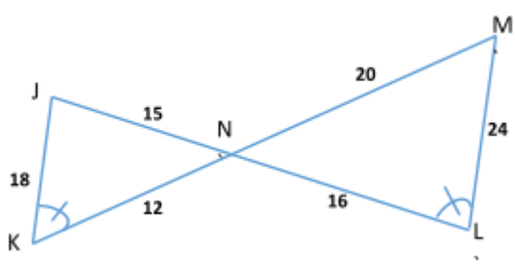

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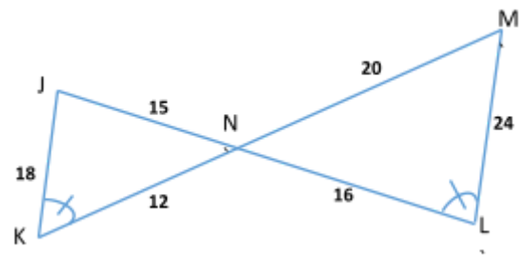
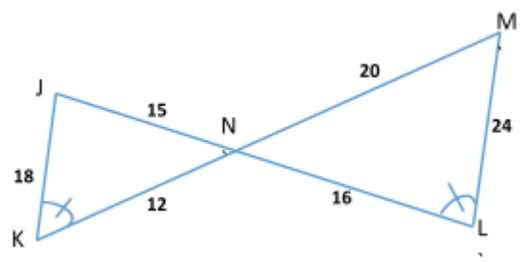


Complete the following using the figure below:

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