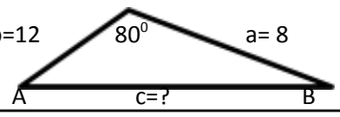
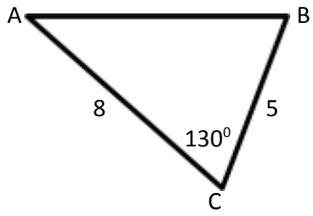
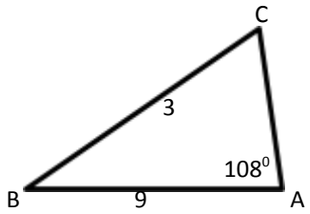
School		Grade Level	Grade 9
Teacher		Learning Area	Mathematics
Teaching Date and Time		Quarter	Fourth
I. OBJECTIVES			
A. Content Standards	The learner demonstrates understanding of the basic concepts of trigonometry.		
B. Performance Standards	The learner is able to apply the concepts of trigonometric ratios to formulate and solve real-life problems with precision and accuracy.		
C. Learning Competencies/ Objectives	Learning Competency: Illustrates laws of sines and cosines. (M9GE-IVf-g1) Learning Objectives: 1. State the Law of Cosine. 2. Solve for the unknown parts of the triangle using the Law of Cosine. 3. Carefully listen to any volunteer and to the teacher during the day's lesson.		
II. CONTENT	Law of Cosine		
III. LEARNING RESOURCES			
A. References			
1. Teacher's Guide	Page 41		
2. Learner's Materials	Page 497- 505		
3. Textbook pages			
4. Additional Materials from Learning Resource (LR) portal			
B. Other Learning Resources			
IV. PROCEDURES			
A. Review previous lesson or presenting the new lesson	The teacher will tell the students that the Law of Cosines can be used in the following situation: Given two sides and the included angle.		
B. Establishing a purpose for the lesson	The teacher will let the students realize that the Law of Cosine can be used when two sides and the included angle are known.		
C. Presenting examples/ instances of the new lesson	 The teacher will show a sample figure and let the students realize its unknown parts.		
D. Discussing new concepts and practicing new skills #1	The teacher will discuss the solution of the sample figure. **Given: two sides and the included angle** $\angle C = 80^0$ a = 8 b = 12 Solutions: To solve for c, $c^2 = a^2 + b^2 - 2ab \cos C$ $c^2 = 8^2 + 12^2 - 2\,(8)\,(12)\,(\cos 80^0)$ $c^2 = 64 + 144 - 192\,(0.1736)$ $c^2 = 208 - 33.3312$ $c^2 = 174.6688$ $c^2 = 13.22$ To determine the measure of angle A, $a^2 = b^2 + c^2 - 2bc\,(\cos A)$ $8^2 = 12^2 + 13.22^2 - 2\,(12)\,(13.22)\cos A$ $64 = 144 + 174.7684 - (37.22)\cos A$ $64 = 318.7684 - (317.28)(\cos A)$ $317.28)(\cos A) = 318.7684 - 64$ $317.28)(\cos A) = 254.7684$ $\text{Cos } A = \frac{254.7684}{317.28} = 0.8030$ $A = 36.58^0$		Since the measure of <C is given and the measure of <A is now known, the measure of <B can be computed using the equation $A + B + C = 180^0$. $A + B + C = 180^0$ $36.58^0 + B + 80^0 = 180^0$ $B = 180^0 - 116.58^0$ $B = 63.42^0$
E. Discussing new concepts and			

	practicing new skills # 2	
F.	Developing mastery (Leads to formative assessment3)	The teacher asks the students to do the following activity individually. He/She then asks two students to show their answers on the board. Solve each triangle. (If answers are not exact, round off to the nearest hundredth). 1.  2.  Answer Key: 1. $a = 11.85\ units; \angle B = 18.86°; \angle C = 31.14°$ 2. $a = 10.33\ units;\ \angle B = 16.06°;\ \angle C = 55.94°$
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 in the Law of Cosine through questions like: 1. Were you able to solve the given triangles? 2. In each of the given triangles, which part did you solve first and why? Possible Answers: 1. Yes 2. I solved first the missing side of the triangle because it is easier.
I.	Evaluating Learning	The teacher lets the students answer individually the formative assessment. Find the third side of each triangle. 1. $b = 122,\ c = 55.9,\ \angle B = 44.2°$ 2. $a = 120,\ b = 180,\ \angle C = 61°$ Answer Key: 1. $b = 90.7$ 2. $c = 161$
J.	Additional activities or remediation	
	V. REMARKS	
	VI. REFLECTION	
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 remediation lesson work? No. of learners who have caught up with the lesson.	
D.	No. of learner 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 of localized materials did I wish to share with other reachers.	

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