THE ERINDALE ACADEMY

COURSE NAME: MPM2D – Principles of Mathematics	
Unit 7_to_8: **OF Learning: Assignment_04_B** **Topics: (7.1 to 8.5)** **Trigonometric ratios, Sine Law and Cosine Law.** **Teacher: Antonio Pietrangelo** **Time: Based on Due Date** **Pages: 14**	**Student's Name:** **Student#:** **Due Date: Monday, December 16th, 2024 @ 2:30 pm EST (Toronto Time)** **Mark: /100**

Categories	Knowledge/ Understanding	Thinking/Inquiry/ Problem Solving	Communication	Application
Symbol	K/U	T/I	C	A
Weight	25 %	25 %	25 %	25 %
Level				

Overall Expectations:

Expectations as listed in the Ontario Curriculum course outline for your specific course.

Specific Expectations:

Chapter 7: Similar Triangles and Trigonometry
7.1 Congruence and Similarity in Triangles
7.2 Solving Similar Triangle Problems
7.3 Exploring Similar Right Triangles
7.4 The Primary Trigonometric Ratios
7.5 Solving Right Triangles
7.6 Solving Right Triangle Problems

Chapter 8: Acute Triangle Trigonometry
8.1 Exploring the Sine Law
8.2 Applying the Sine Law
8.3 Exploring the Cosine Law
8.4 Applying the Cosine Law
8.5 Solving Acute Triangle Problems

Rubrics:

Category	Level R (0 – 49%)	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)	Level/ Mark
Knowledge – Understanding of **(Specific Expectations: 7.1 to 8.5)**	**demonstrates insufficient understanding**	demonstrates limited understanding	demonstrates some understanding	demonstrates considerable understanding	demonstrates thorough understanding	
				Individual: Mark:		

Category	Level R (0 – 49%)	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)	Level/ Mark
Thinking and Inquiry (What if scenarios) of: **(Specific Expectations: 7.1 to 8.5)**	demonstrates insufficient ability to apply different scenarios	demonstrates limited ability to apply different scenarios	demonstrates some ability to apply different scenarios	demonstrates considerable ability to apply different scenarios	demonstrates through ability to apply different scenarios	
				Individual: Mark:		

Category	Level R (0 – 49%	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)	Level/ Mark
Communication **Communicates effectively** **(Specific Expectations: 7.1 to 8.5)**	demonstrates **insufficient** ability to communicate effectively	demonstrates **limited** ability to communicate effectively	demonstrates **some** ability to communicate effectively	demonstrates **considerable** ability to communicate effectively	demonstrates **through** ability to communicate effectively	
				Individual: Mark:		

Category	Level R (0 – 49%	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)	Level/ Mark
Application: Demonstrates the ability to apply mathematical principles to real world situations using trigonometric ratios, sine law, and cosine law. **(Specific Expectations: 7.1 to 8.5)**	demonstrates **insufficient ability**	demonstrates **limited ability**	demonstrates **some ability**	demonstrates **considerable ability**	demonstrates **thorough ability**	
				Individual: Mark:		

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PART A: KNOWLEDGE AND UNDERSTANDING (K/U) – 25%

2 Marks Per Question

Instructions:

Question 1: The Pythagorean Theorem is used on acute angle triangles only? (True or False)

Question 2: The tangent ratio is slope of a right-angle triangle? (True or False)

Question 3: SOH CAH TOA is used to figure out the Trigonometric ratios of right-angle triangles? (True or False)

Question 4: The TOA of SOH CAH TOA is to help remember the Cosine ratio? (True or False)

Question 5: The SOH of SOH CAH TOA is to help remember the Sine ratio? (True or False)

PART B: THINKING AND INQUIRY (T/I) - 25%

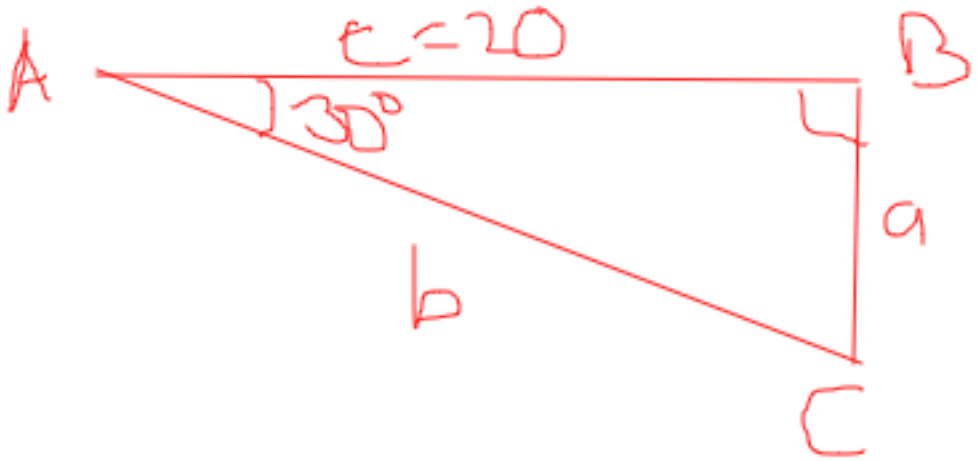
10 Marks Per Question

Instructions:

Question 1: Complete the triangle by find all the angles and lengths of the sides of the triangle below:

To solve a triangle - means to find all the six (6) measurements of a triangle:

1. 3 sides
2. 3 angles.



Question 2: Find the distance between two people from the based of a flag pole.

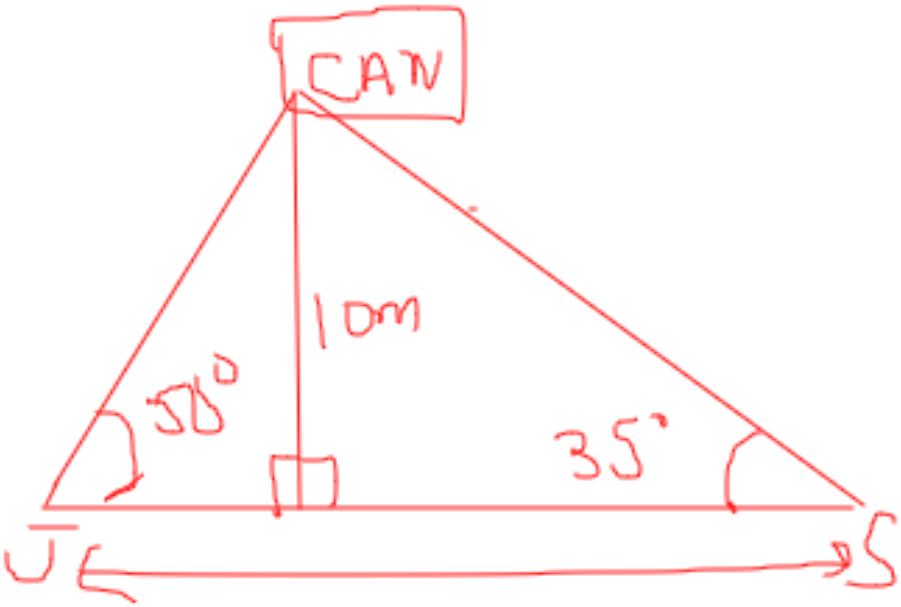
Word Problem:

Jack and Sangita are facing each other on the opposite sides of a 10-metre flagpole.

From Jack's point of view, the top of the flagpole is at an angle of elevation of 50°.

From Sangita's point of view, the top of the flagpole is at an angle of elevation of 35°.

Question: How far apart are the Jack and Sangita?



Find the distance between Jack and Sangita?

PART C: COMMUNICATION (C) – 25%

10 Marks Per Question

Question 1: Communicate as best as possible when we should use the following formula Trigonometric ratios and formulas below:

Key formulas:

1. Pythagorean Theorem:
   $r^2 = x^2 + y^2$ ← $r = \sqrt{x^2 + y^2}$ ← $c^2 = a^2 + b^2$ ← used for right angles only
   $c^2 = \sqrt{a^2 + b^2}$ ← $c = \sqrt{a^2 + b^2}$
2. Trigonometric ratios:

Standard Trig. Functions	Abbreviation		
SOH CAH TOA			
sine	$\sin(\theta)$	$\sin(\theta)= \frac{opposite}{hypotenuse} = \frac{opp}{hyp} = \frac{y}{r}$	
cosine	$\cos(\theta)$	$\cos(\theta) = \frac{adjacent}{hypotenuse} = \frac{adj}{hyp} = \frac{x}{r}$	
tangent	$\tan(\theta)$	$\tan(\theta) = \frac{opposite}{adjacent} = \frac{opp}{adj} = \frac{y}{x}$	
Reciprocal Functions			
sine ← cosecant	$\csc(\theta) = \frac{1}{\sin(\theta)}$	$\csc(\theta) = \frac{1}{\sin(\theta)} = \frac{hyp}{opp} = \frac{r}{y}$	
cosine ← secant	$\sec(\theta) = \frac{1}{\cos(\theta)}$	$\sec(\theta) = \frac{1}{\cos(\theta)} = \frac{hyp}{adj} = \frac{r}{x}$	
tangent ← cotangent	$\cot(\theta) = \frac{1}{\tan(\theta)}$	$\cot(\theta) = \frac{1}{\tan(\theta)} = \frac{adj}{opp} = \frac{x}{y}$	

3. Sine Law ← Acute Angles
   $\frac{a}{Sine(A)} = \frac{b}{Sine(B)} = \frac{c}{Sine(C)}$
4. Cosine Law ← Acute Angles
   $a^2 = b^2 + c^2 - 2bc(\cos(A))$
   $b^2 = a^2 + c^2 - 2ac(\cos(B))$
   $c^2 = a^2 + b^2 - 2ab(\cos(C))$

Provide in your words your explanation when to use these Trigonometric Ratios and formulas above:

PART D: APPLICATION (A) – 25%

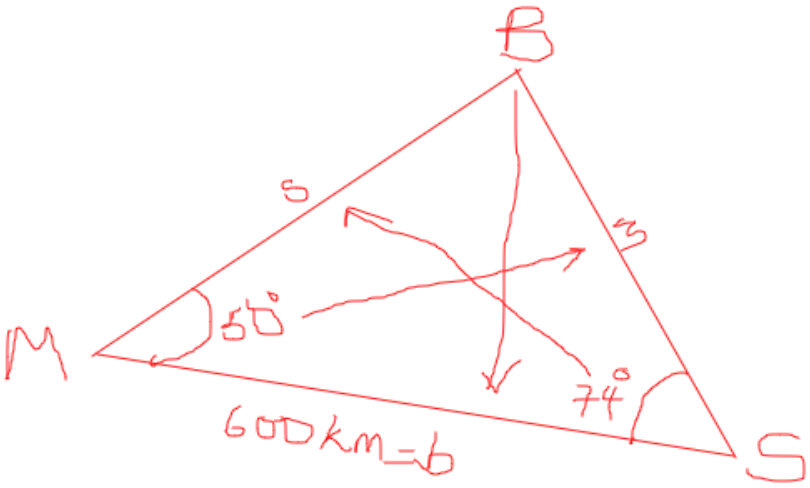
10 Marks Per Question

Instructions:

Question 1: Use the Sine Law to solve the problem below:

Using the Sine Law – Find the Perimeter Length of the Bermuda Triangle:

Use the information given on the diagram to determine the perimeter of the Bermuda Triangle, to the nearest kilometer.



M is the label for the city of Miami.
B is the label for Bermuda.
S is the label for the city of San Juan of Portico Rico.

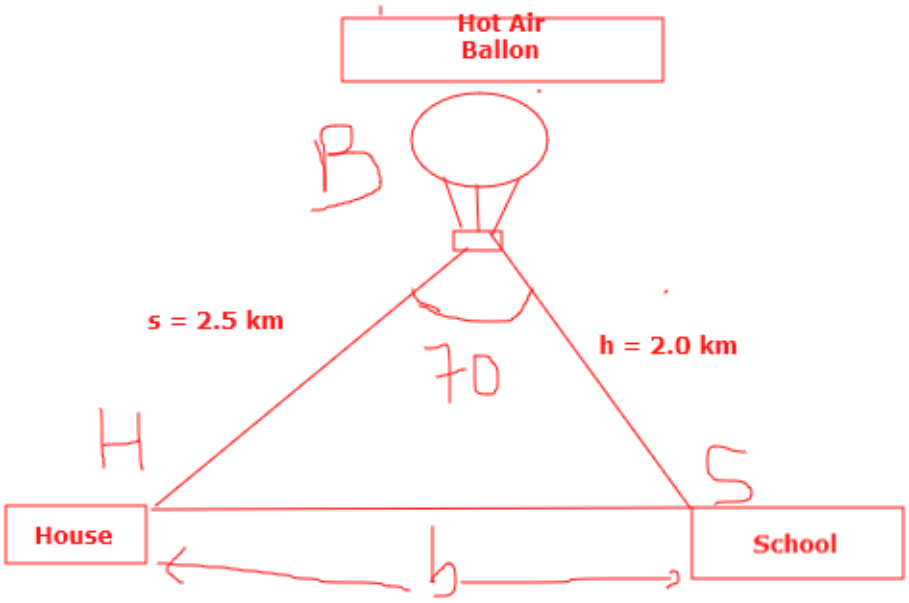
Let s is the length of distance between Miami and Bermuda.
Let m is the length in km distance between San Juan and Bermuda.

Find the Total length (Perimeter) to the nearest km.

Hint: Use the Sine Law.

Question 2: Use the Cosine Law to solve the problem below:

Use the Cosine Law to find the distance between two objects:



Chandra is riding in a hot-air balloon and spots her house and her school. She estimates how far away they are from her, and the angle separating their lines of sight, as shown in above.

1. How far apart is Chandra's house and school, that is, solve for b.

THE END

THANK YOU!!!