Name:_____

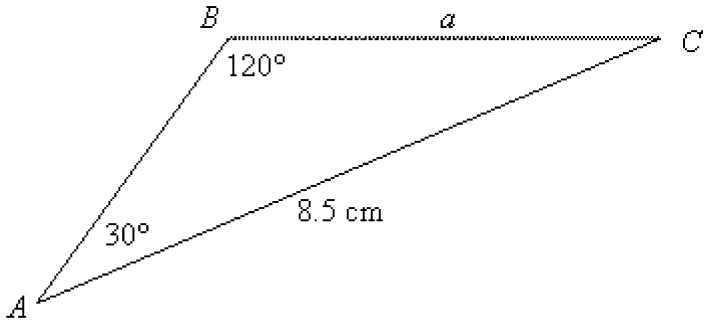
MCR3U U5 - Trigonometric Ratios: The Sine and Cosine Laws: Practice

Learning Goal: We are learning to use the Sine and Cosine Laws to solve non-right angle triangles.

Success Criteria:

- I can recognize when the sine law applies and use it to solve for an unknown value
- I can identify, given S-S-A, that there may be two solutions (the ambiguous case)
- I can use the cosine law, given S-A-S or S-S-S
- I can rearrange the cosine law to solve for an unknown angle

1. Determine the length of a to the nearest tenth of a cm.



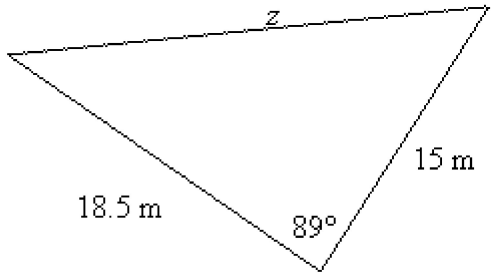
2. **Ambiguous (BUM) Case**: Solve BOTH triangles sharing the following information:
$a = 7.2mm, b = 9.3mm, \angle A = 35°$

3. In $\triangle ABC$, $a = 5.4$ m, $b = 7.2$ m, and $c = 10.0$ m. Determine $\angle A$ to the nearest degree.

4. In $\triangle ABC$, $a = 25.8$ m, $b = 13.2$ m, and $\angle C = 47°$. Determine c to the nearest tenth of a metre.

5. The posts of a hockey goal are 2.0 m apart. A player attempts to score by shooting the puck along the ice from a point 7.2 m from one post and 8.6 m from the other. Within what angle θ must the shot be made? Round your answer to the nearest degree.

6. Determine z to the nearest tenth of a metre.



7. Ben and Kara are both looking at the top of a tower in the distance in the same line of sight, although Kara is 100 m ahead of Ben. Ben observes the tower at an angle of 16° with the ground. If the top of the tower is 800 m from Kara, what is Kara's angle of sight with the ground? First make a sketch and then solve the problem.

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Answer Section

SHORT ANSWER

1. ANS:
   $a = 4.9$ cm

   PTS: 1 REF: Knowledge and Understanding OBJ: 5.6 - The Sine Law
2. ANS:
   woo

   PTS: 1
3. ANS:
   $\angle A = 32°$

   PTS: 1 REF: Knowledge and Understanding OBJ: 5.7 - The Cosine Law
4. ANS:
   19.4 m

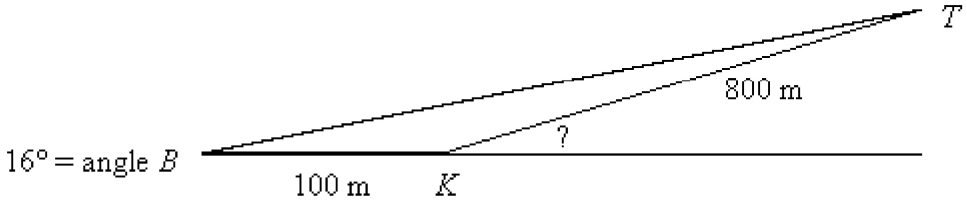
   PTS: 1 REF: Knowledge and Understanding OBJ: 5.7 - The Cosine Law
5. ANS:
   $\theta = 10°$

   PTS: 1 REF: Application OBJ: 5.7 - The Cosine Law
6. ANS:
   $z = 23.6$ m

   PTS: 1 REF: Knowledge and Understanding OBJ: 5.7 - The Cosine Law

PROBLEM

7. ANS:



   Use the sine law to find $\angle BTK = 1.97°$.
   So, $\angle BKT = 162.03°$ since the sum of the interior angles of a triangle is 180°.
   Since there is a straight line, the unknown angle can be found to be $180° - 162.03° = 17.97° \doteq 18°$.
   So, Kara's angle of sight with the ground is about 18°.

   PTS: 1 REF: Thinking OBJ: 5.6 - The Sine Law