Hole Check (SING LAN)



9. The Pont du Gard near Nîmes, France, is a Roman aqueduct. An observer in a hot-air balloon some distance away from the aqueduct determines that the angle of depression to each end is 54° and 71°, respectively. The closest end of the aqueduct is 270.0 m from the balloon. Calculate the length of the aqueduct to the nearest tenth of a metre.



i. Ne aquisant is 77.6 m log

Chapter 5 – Trigonometric Ratios

5.7: The Cosine Law

The Cosine Law is another "formula" for solving Oblique Triangles. Remember, to "solve" a triangle you MUST be given 3 PIECES OF INFORMATION about the triangle (and I should note that one of those given pieces MUST BE A SIDE LENGTH).

The main question you will have to be able to answer is this:

When do you use 1) SOH CAH TOA When you have a right and tringle 2) The SINE LAW When you have a Obligne -56 Tria and you have a CORRESPONDING PALR in the triangle R 8.1 3) The COSINE LAW when we have gle AND when we CAN sine Low D ٩ 87

9.

The Cosine Law (for oblique triangles)

There are **THREE SIDE FORMS** you should know!!

Given the non-right triangle, $\triangle ABC$, then:

 $a^2 = b^2 + c^2 - 2bc\cos(A)$

or

$$b^2 = a^2 + c^2 - 2ac\cos(B)$$

or

 $c^2 = a^2 + b^2 - 2ab\cos(C)$

Also, there are **THREE ANGLE FORMS** you should know!!

 $\cos(A) = \frac{b^2 + c^2 - a^2}{2bc}$

0 6

The formula you use depends on which side or angle you are looking for!!!

8 cm

10 cm

or

$$\cos(B) = \frac{a^2 + c^2 - b^2}{2ac}$$

or

$$\cos(C) = \frac{a^2 + b^2 - c^2}{2ab}$$

e.g. Determine angle B

 $Cos(B) = \frac{a^2 + c^2 - b^2}{2ac}$

$$B = Cas^{-1} \left(\frac{1s^2 + 8^2 - 5^2}{2(1s)(8)} \right) = 35^{\circ}$$

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Example 5.7.1

From your text: Pg. 326 #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 6.5 m from one post and 8.0 m from the other. Within what angle θ must the shot be made? Round your answer to the nearest degree.

$$(o_{S}(A) = \frac{b^{2} + c^{2} - a^{2}}{2bc}$$

$$\Rightarrow A = Cos^{-1} \left(\frac{6 \cdot 5^{2} + 8^{2} - 2^{2}}{2(6 \cdot 5)(8)} \right) = 11^{\circ}$$



Example 5.7.2

From your text: Pg. 327 #7

Given $\triangle ABC$ at the right, BC = 2.0 and D is the midpoint of BC. Determine AB, to the nearest tenth, if $\angle ADB = 45^{\circ}$ and $\angle ACB = 30^{\circ}$.





Class/Homework: Page 326 - 327 #4ad (do you "need" to use the cosine law?), 6, 8 - 10