Assignment

Kinematics Worksheet II

Introduction to Robotics
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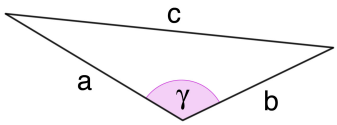
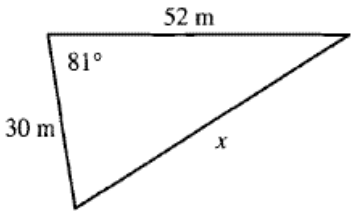
SHOW YOUR WORK.

Recall in class we introduced the Law of Cosines, which related the three sides of a triangle to any one internal angle, and it holds for all triangles, not just right triangles. While it may be difficult to do the correspondence of letters to your own drawn triangle, an easy way to remember the equation is that the letters "a" and "b" will always sandwich the angle "gamma" between them.

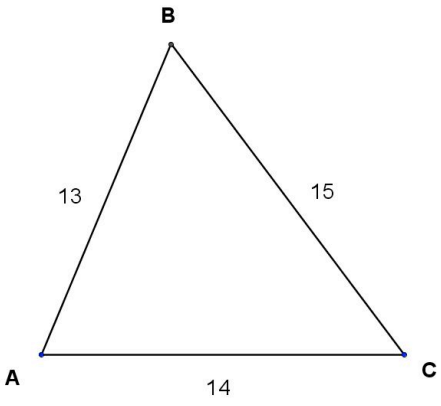


$$c^2 = a^2 + b^2 - 2ab(\cos(\gamma))$$

1. Use the Law of Cosines to solve for the "x" in the diagram below:



2. Use the Law of Cosines to solve for the three internal angles of the triangle below, i.e. angles A, B, and C, for the given side lengths as shown.



3. Consider the diagram below. One of the vertices of the triangle is given as (10, -10) in the coordinate frame drawn. Solve for the missing edge, and all three internal angles of the triangle using the Law of Cosines, and be sure to label all internal angles in the diagram with their value.