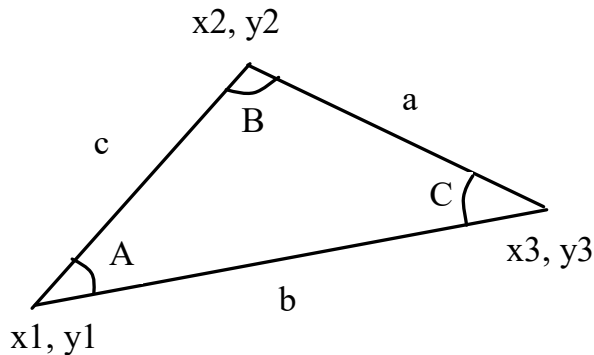


Hands-on activities 1

Mathematical functions, strings, loops



- Write a program that prompts the user to enter the x- and y-coordinates of the three corner points in a triangle
- Displays the triangle's angles and area.
- Display an error message if the three points are collinear.



$$A = \arccos \left(\frac{a^2 - b^2 - c^2}{-2bc} \right)$$
$$B = \arccos \left(\frac{b^2 - a^2 - c^2}{-2ac} \right)$$
$$C = \arccos \left(\frac{c^2 - b^2 - a^2}{-2ab} \right)$$

- The Monte Carlo simulation refers to a technique that uses random numbers and probability to solve problems.
- This method has a wide range of applications in computational mathematics, physics, chemistry, and finance
- Example - approximating π
- Idea:
 - circleArea = π
 - squareArea = 4
 - =>
 - circleArea / squareArea = $\pi / 4$ or
 - $\pi = 4 \text{ circleArea} / \text{squareArea}$
- π can be approximated by
 - $4 * \text{numberOfHits} / \text{numberOfTrials}$
- Write a program that approximates π

