Applications of Circle Theorems with Marine Navigation

RESEARCH DESIGN

Following is the mathematical concepts and formulas that is utilized in this project.

- **Circle Theorems (Additional)**
  - Tangents (See figure 1)
    - If two tangents are drawn on a circle and they cross, the lengths of the two tangents (from the point where they touch the circle to the point where they cross) will be the same.

      ∴ Length of the two ls are the same.
  - Angle in a Semi-Circle (See figure 2)
    - Angles formed by drawing lines from the ends of the diameter of a circle to its circumference form a right angle.

      ∴ Angle C is a right angle.

- **Trigonometry (Core)**
  - **S**OH **C**AH **T**OA (See figure 3)
    - 1) Calculate to find one angle of choice (other than the right angle)
    - 2) Calculate for the distance to the horizon
      - For an in-detail calculation and explanation, refer to the Application of Mathematics

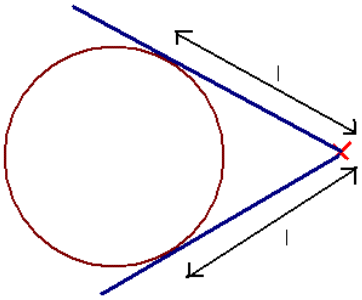


Figure 1

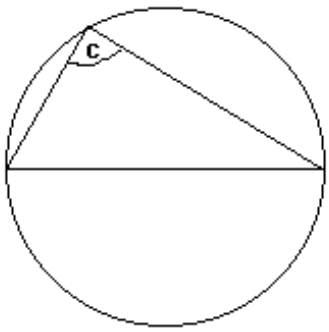


Figure 2

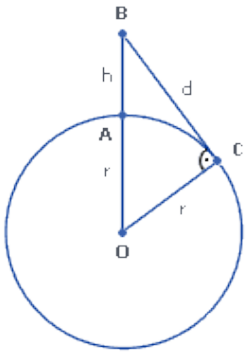


Figure 3

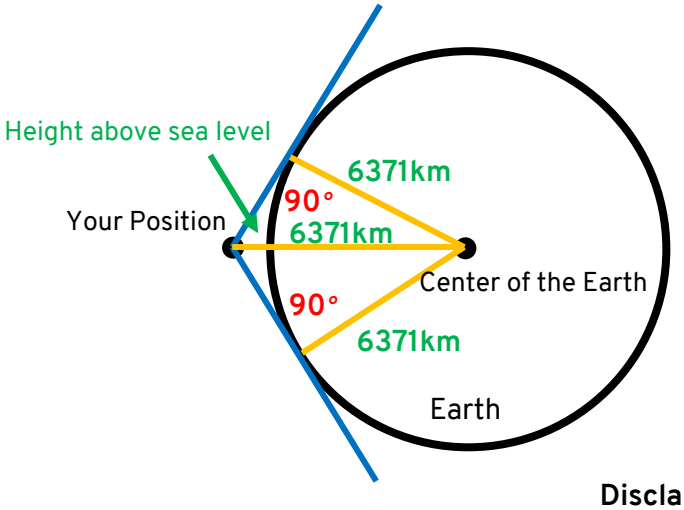
All these concepts mentioned above, including basic geometry and visualization of shapes are all required to be understood to be able to understand this project. We are going to apply the concepts into our project using clear illustrations, rather than long walls of text which takes a very long time to finish reading.

Step 1
Draw tangents

Step 2
Draw lines to center

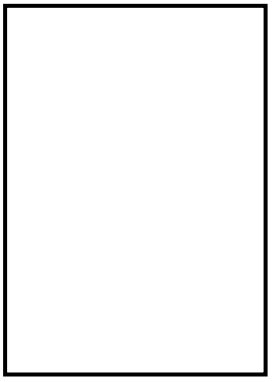
Step 3
Mark right angles

Step 4
Calculate using trig



Disclaimer: Not to scale.
If it is to scale, our illustration would be microscopic.

Our final project will be in a form of an A2-sized poster, and a website.



A2 Poster

Website