



identical to the Apollo spacecraft. Ultimately, this design was found to meet the requirements while being the most effective within the safety goals.

For more information about Orion and the Vision for Space Exploration, visit www.nasa.gov.



NASA concept of the Orion crew module



Apollo capsule

Figure 2: Shape comparison of the Orion crew module and the Apollo capsule (not to scale)

Instructional Objectives

- You will decompose a larger geometric shape into smaller parts.
- You will apply the proper area formulas for various geometric shapes.
- You will estimate the area of a complex geometric shape using decomposition methods.

Problem

The Orion spacecraft will replace the space shuttle as NASA's spacecraft for human space exploration. The vehicle is designed to accommodate four to six astronauts traveling into space. This activity focuses on the Orion crew module, one of four functional modules of the Orion spacecraft. You will find the areas of the largest vertical and horizontal cross-sections. This information will provide you with a sense of the room within the crew module. You will also be asked how many crew modules could fit in your classroom. This might be extended to larger areas such as the gymnasium or cafeteria.

1. To get a sense of the room inside the crew module, find the area, in square meters (m^2), for the largest vertical cross-section (Figure 3; Figure 4). Show how you would decompose, or break the figure into smaller parts, to estimate the total vertical area. You may use a calculator. Record your information in the table provided (Table 1). Please round your answer to three decimal places.

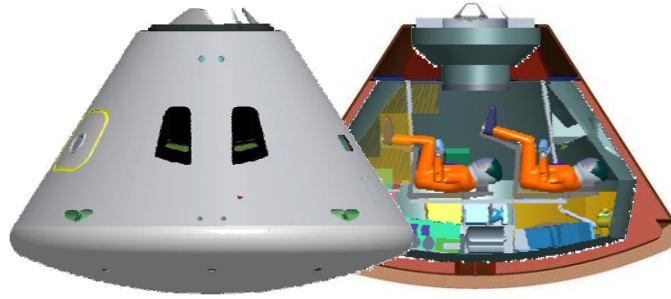


Figure 3: Vertical cross-section of the Orion crew module (NASA Concept)

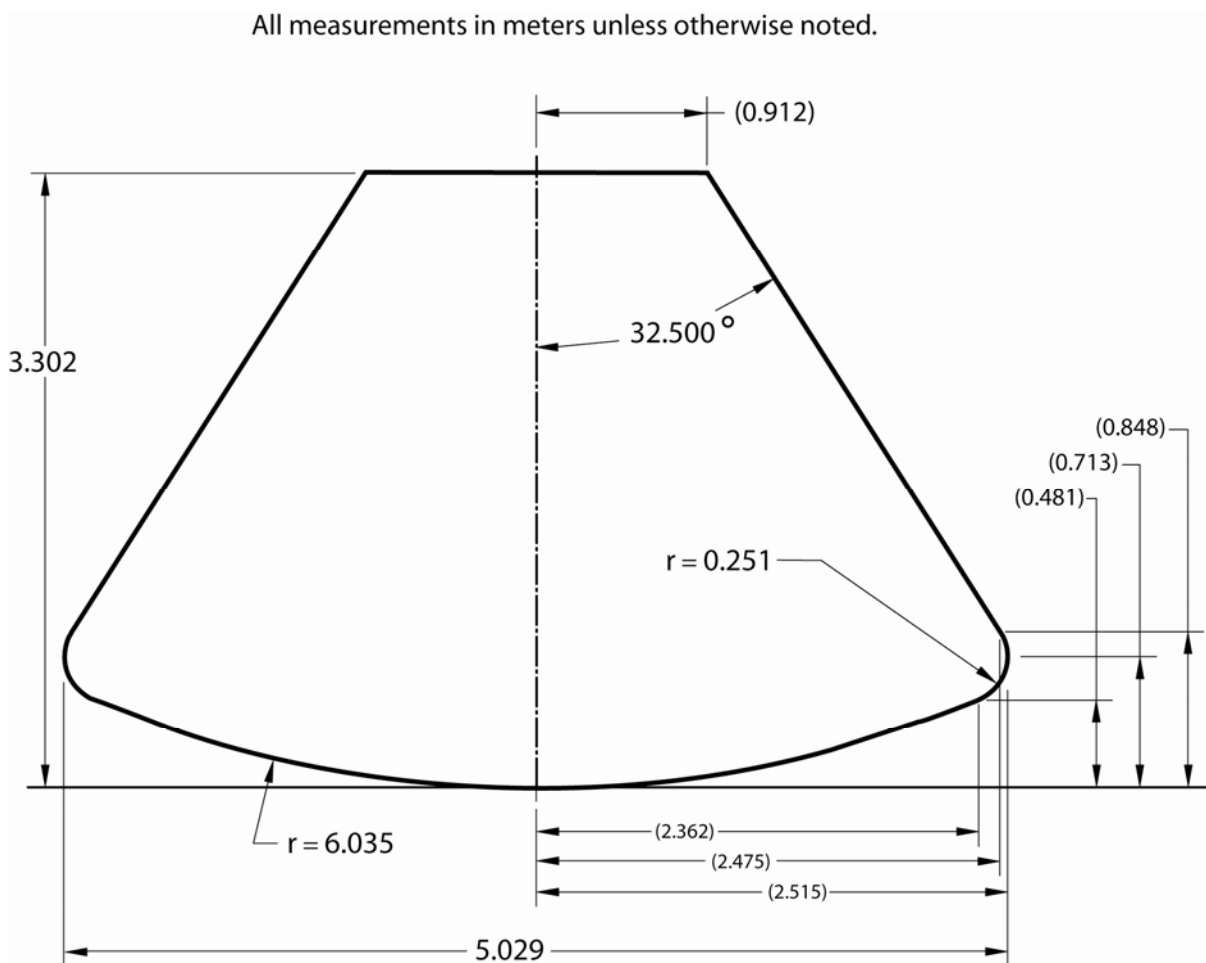


Figure 4: Largest vertical cross-section of the Orion crew module



Table 1: Vertical Cross-Section Area Data

Figure	Area Formula	Area Formula with Values	Area (m ²)
Total Area:			

- If the actual largest vertical cross-sectional area of the crew module is 11.665 m², how far off was your estimate? Express your answer in terms of a percent (percent error). Please round your answer to the nearest percent.
- Find the area, in square meters (m²), for the largest horizontal cross-section (Figure 5; Figure 6). Show how you would decompose, or break the figure into smaller parts, to estimate the total horizontal area. You may use a calculator to evaluate the formulas. Record your information in the table provided (Table 2). Round your answer to three decimal places.

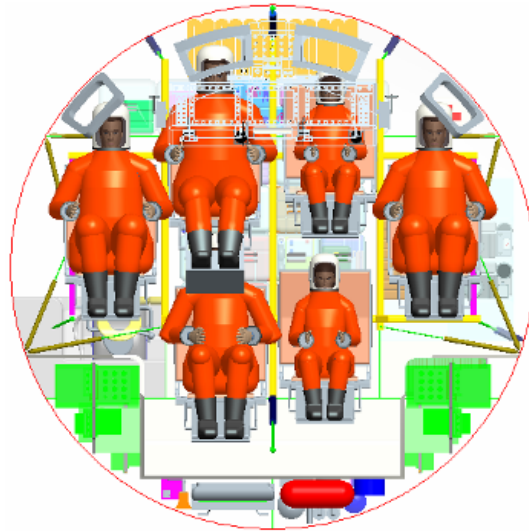


Figure 5: Horizontal cross-section of the Orion crew module (NASA Concept)

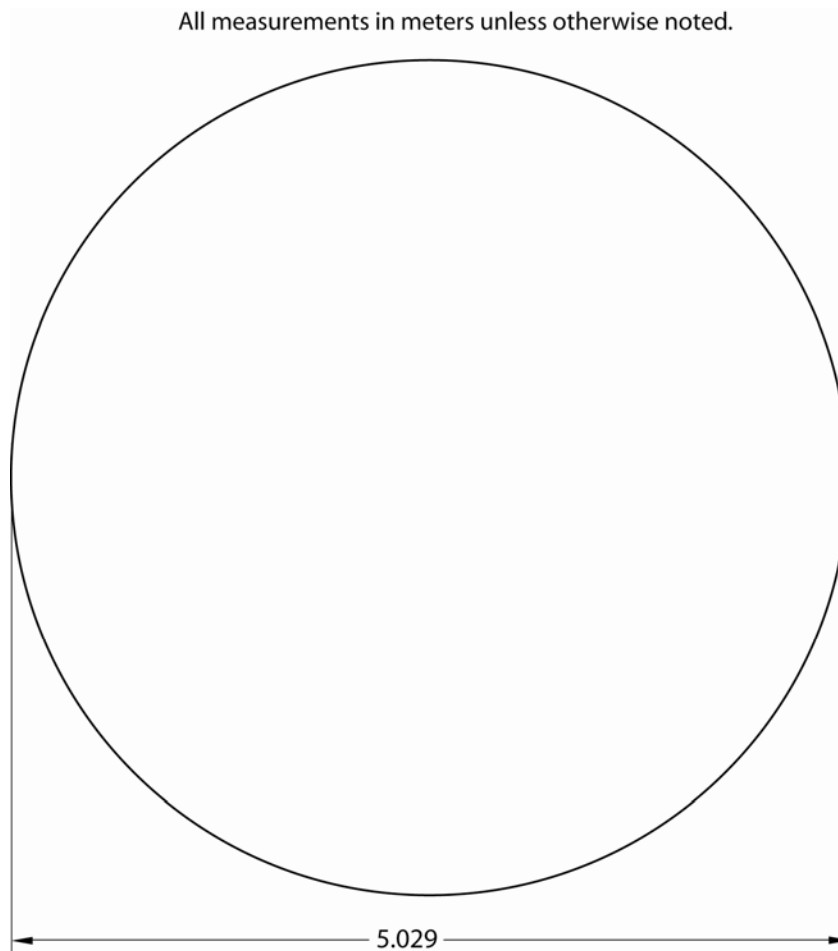


Figure 6: Largest horizontal cross-section of the Orion crew module

