

Sphere



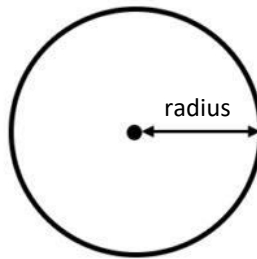
'Sphere' is a music and entertainment arena near Las Vegas, USA. It is a venue for live entertainment powered by cutting-edge technologies that ignite the senses. It is well known for its outer surface which features 54,000m² of LED screens. These are used for advertising and to display certain themes. It has been a huge Christmas snow globe and a gigantic Halloween pumpkin. It most often shows a face whose eyes seem to follow nearby road traffic and aircraft.

To create 'Sphere', its designers combined centuries old mathematics with cutting edge engineering. It cost \$2.3 billion dollars to construct.

The surface area of a sphere can be calculated using this formula:

$$\text{surface area} = 4 \times \pi \times \text{radius}^2$$

Pi or π , π is an irrational number. It continues forever without repeating. It is called irrational because it cannot be written as a fraction. Rounded to fifteen decimal places it is 3.14159265358579



Almost 4000 years ago the ancient Babylonians calculated the value of π to be 3. In other words, any circle's circumference was 3 times the size of its diameter.

The ancient Greeks used a more accurate value of 3.125. You can see this on the Rhind Papyrus in the British Museum.

Around 2300 years ago the Greek mathematician, Archimedes estimated π to be between 3.1408 and 3.1428.

In 1989, pi was calculated to over 1 billion decimal places by two Ukranian brothers using a supercomputer

1. What is the difference between a sphere and a circle?
2. If one US dollar = 80 pence how much money in pounds did Sphere cost to build?
3. If Sphere has a radius of 78 m what is the surface area? Show your working out.
4. Why do you think mathematicians throughout history have tried to calculate more accurate values of π ? Why not just stick with 3?