

Section 6.2: Volumes

These notes reflect material from our text, *Calculus, Concepts and Contexts, Third Edition*, by James Stewart, published by Brooks/Cole, Pacific Grove, CA, 2005.

Key points from Stewart, Section 6.2: Volumes of solids of revolution.

Concepts

The **solid of revolution** obtained by revolving a region about the x or y axis.

The method of **washers** for finding the volume of certain solids of revolution,

$$\text{volume} = \int_a^b \pi [f(x)]^2 dx.$$

The method of **cylindrical shells** for finding the volume of certain solids of revolution,

$$\text{volume} = \int_a^b 2\pi x f(x) dx.$$

Cavalieri's Principle for finding the volume of an object whose cross-sectional area $A(x)$ is known at each point $a \leq x \leq b$,

$$\text{volume} = \int_a^b A(x) dx.$$

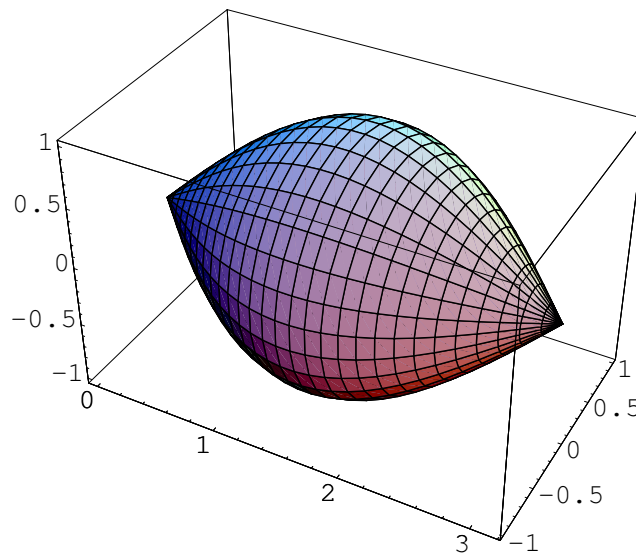


Fig. The Trigonometric Football.

Exercises

Exercises for Section 6.2, pp 457–460: 5, 7, 9, 17, 19, 22 (volumes), 23 (CAT scan), 25 (cone), 27 (cap of a sphere), 33, 39 (volume of a torus), 41 (Cavalieri's principle), 48 (loon's egg)