Companion Sheet

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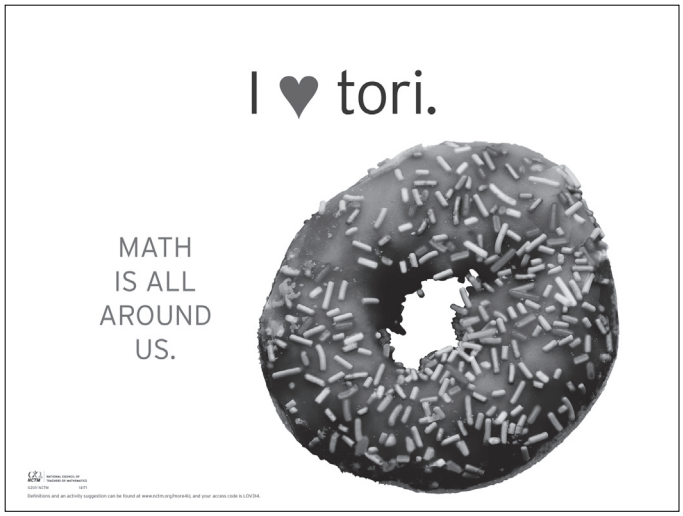

DEFINITION

A torus (plural, *tori*) can be thought of as the shape formed when a circle is rotated 360° around a line in its plane that shares no points in common with the circle. Thus, the circle with equation $(x - 2)^2 + y^2 = 1$ will create a torus if it is rotated around the y-axis.

The torus is one of the classic shapes that mathematicians use when introducing the field of topology to students. Whereas Euclidean geometry studies the properties of figures that remain invariant when they are rigidly transformed, topology studies the properties of figures that are flexed, bent, stretched, or otherwise continuously deformed without cutting or tearing them.

MATH IS ALL AROUND US

Doughnuts, inner tubes, and bagels are all real-world examples of tori.

ACTIVITY

The torus is said to be a topological shape of genus 1, meaning that it has one hole. A coffee mug is also a topological shape of genus 1, and these two shapes are said to be topologically equivalent because one can be deformed into the other. Many websites have demonstrations that show this deformation, including the Wikipedia entry for topology.

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