

Now

In Chapter 12, you will apply the big ideas listed below and reviewed in the Chapter Summary on page 830. You will also use the key vocabulary listed below.

Big Ideas

- 1 Graphing rational functions
- 2 Performing operations on rational expressions
- 3 Solving rational equations

KEY VOCABULARY

- inverse variation, p. 765
- constant of variation, p. 765
- hyperbola, p. 767
- branches, asymptotes of a hyperbola, p. 767
- rational function, p. 775
- rational expression, p. 794
- excluded value, p. 794
- simplest form of a rational expression, p. 795
- least common denominator (LCD) of rational expressions, p. 813
- rational equation, p. 820

Why?

You can use rational functions to solve problems in biology. For example, you can graph a rational function to describe how a microorganism's efficiency at performing metabolic tasks changes as its dimensions change.

Animated Algebra

The animation illustrated below for Exercise 49 on page 791 helps you answer this question: How does changing one dimension of a cylindrical microorganism change the ratio of the cylinder's surface area to its volume?

The screenshot shows an interactive animation interface. On the left, a 3D scene contains various geometric shapes: a cylinder, a sphere, a cone, a cube, and a pyramid. A 'Start' button is at the bottom right of this scene. Below the scene, text reads: 'You want to see how the height affects the ratio of surface area to volume.'

On the right, a question is posed: 'What happens to the surface area to volume ratio if the height increases, but the radius does not change?'. Below the question is a table with two columns: 'Height' and 'SA/V ratio'. The first row contains the values '1' and '4'. A 'Plot' button is to the right of the table. Below the table is a coordinate plane with 'SA/V ratio' on the vertical axis and 'Height' on the horizontal axis. A single point is plotted at (1, 4). To the right of the graph is a 3D cylinder. A 'Continue' button is at the bottom right. Below the graph and cylinder, text reads: 'Drag the cylinder to change its height. Then update the table and the graph.'

Animated Algebra at classzone.com

Other animations for Chapter 12: pages 766, 777, 783, 804, 814, and 830