

## Now

In Chapter 5, you will apply the big ideas listed below and reviewed in the Chapter Summary on page 401. You will also use the key vocabulary listed below.

## Big Ideas

- 1 Graphing polynomial functions
- 2 Performing operations with polynomials
- 3 Solving polynomial equations and finding zeros

### KEY VOCABULARY

- polynomial, p. 337
- polynomial function, p. 337
- synthetic substitution, p. 338
- end behavior, p. 339
- factored completely, p. 353
- factor by grouping, p. 354
- quadratic form, p. 355
- polynomial long division, p. 362
- synthetic division, p. 363
- repeated solution, p. 379
- local maximum, p. 388
- local minimum, p. 388
- finite differences, p. 393

## Why?

You can use polynomial functions to model real-life situations. For example, you can use a polynomial function to model the relationship between the speed of an object and the power needed to maintain that speed.

## Animated Algebra

The animation illustrated below for Exercise 61 on page 351 helps you answer this question: How does the power needed to keep a bicycle moving at a constant speed change as the conditions change?

The screenshot shows an interactive animation interface. On the left, a 3D-rendered cyclist is shown riding up a green hill. Below the image is a 'Start' button and the text: 'The power exerted by a bicyclist depends on speed and resistance.' On the right, there is a 'Settings' panel with three sliders: 'Bicyclist's Speed' set to 5 mph, 'Road Surface' set to 2% incline, and 'Wind Speed' set to 5 mph. To the right of the sliders is a 'Calculations' panel with input fields for 'P =', 'F =', and 'Power needed ='. Below the sliders is a small 2D diagram of a cyclist on a slope. Below the diagram is the text: 'So far, we have looked at a bicyclist traveling on level ground. The power equation will change depending on the amount of resistance.' and an 'Animate' button.

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Other animations for Chapter 5: pages 331, 340, 371, 388, 396, and 401