ACTIVITY 10 Continued

Check Your Understanding

Debrief students' answers to these items to ensure that they understand concepts related to equations of parabolas.

Answers

- **23.** No. Sample explanation: To write the equation of a parabola, you need to know the value of *p*. To determine the value of *p* given the vertex, you would also need to know either the focus or the directrix of the parabola.
- **24.** vertex: (1, 2); axis of symmetry: *y* = 2; focus: (3, 2); directrix: *x* = −1

ASSESS

Students' answers to Lesson Practice problems will provide you with a formative assessment of their understanding of the lesson concepts and their ability to apply their learning. See the Activity Practice for additional problems for this lesson. You may assign the problems here or use them as a culmination for the activity.

LESSON 10-1 PRACTICE



27. axis of symmetry: y = 2; vertex: (-3, 2); opens to the right 28. $y = -\frac{1}{2}x^2$ 29. $x = \frac{1}{16}y^2$ 30. $x = -\frac{1}{20}(y-5)^2$ 31. $y = \frac{1}{12}(x-3)^2 - 4$ 32. $x = \frac{1}{4}(y-4)^2 - 2$

ADAPT

Check students' answers to the Lesson Practice to ensure that they understand the geometric definition of a parabola, its component parts, and the general form of the equation of a parabola. Students should be able to match graphs to their equations and vice versa. Encourage students who require extra practice to create their own problems using Lesson Practice Items 28–32 as a template. Students can check their own work by graphing the equation they write on a graphing calculator.



22. Sample derivation:

distance from P to focus = distance from P to directrix

$$\begin{split} \sqrt{(x-h)^2 + (y-(k+p))^2} &= \sqrt{(x-x)^2 + (y-(k-p))^2} \\ (x-h)^2 + (y-(k+p))^2 &= (x-x)^2 + (y-(k-p))^2 \\ (x-h)^2 + y^2 - 2(k+p)y + (k+p)^2 &= y^2 - 2(k-p)y + (k-p)^2 \\ (x-h)^2 + y^2 - 2ky - 2py + k^2 + 2pk + p^2 &= y^2 - 2ky + 2py + k^2 - 2pk + p^2 \\ (x-h)^2 - 2py + 2pk &= 2py - 2pk \\ (x-h)^2 + 4pk &= 4py \\ \frac{1}{4p}(x-h)^2 + k &= y \end{split}$$