

# DIGITAL

Graph.

**5.** 
$$y = 2x^2$$



**6.**  $y = -x^2 + 5$ 

 $\oplus$ 



**7.**  $y = -(x + 2)^2 + 4$ 



**8.**  $y = 2(x - 1)^2 - 1$ 



© 2003 BestQuest

Module 14 Lesson 2

# DIGITAL

 $\rightarrow x$ 

**9.**  $y = -2(x + 3)^2 + 2$ 



**11.**  $y = 2x^2 - 8x + 11$ 



**12.**  $y = -2x^2 + 4x - 3$ 

**10.**  $y = 4(x - 1)^2 - 3$ 

y

 $\oplus$ 



© 2003 BestQuest

Module 14 Lesson 2

### DIGITAL



- **1.** In the equation  $y = ax^2$ , how does the value of a change the graph?
- **2.** In the equation  $y = x^2 + k$ , how does the value of k change the graph?
- **3.** In the equation  $y = a(x h)^2 + k$ , how does the value of *h* change the graph?
- **4.** Rodrigo says that the graph of  $y = 4(x + 1)^2 + 3$  looks like Figure 1, and Marny says that it looks like Figure 2. Who is correct and why?



Figure 1

Figure 2

**5.** Explain how to identify the vertex of the graph of the equation  $y = -x^2 + 4x + 3$ .

### **Cumulative Review**

Solve the equations by completing the square.

<b>1.</b> $2x^2 + 4x - 6 = 0$	<b>2.</b> $x^2 + 8x = 10$
<b>3.</b> $3x^2 + 12x + 3 = 0$	<b>4.</b> $-2x^2 + 4x + 8 = 0$
<b>5.</b> $-3x^2 - 24x - 33 = 0$	<b>6.</b> $2x^2 - 12x + 12 = 0$

#### **Calculator Problem**

Graph the equation  $y = -2x^2 + 4x - 1$  using a calculator. Find numerical estimates for the equation's vertex, axis of symmetry, and one point on the graph, which is not the vertex.

- **1.** Press  $\mathbb{Y}$  and enter the function into  $\mathbf{Y}_1$ =. See Figure 1.
- 2. Press GRAPH. See Figure 2.
- Since the graph of the equation opens down, the vertex of the graph is the point with the maximum y value. From the CALC menu, select 4:maximum. Left Bound? will appear in the lower left hand corner of the screen. Use the arrow keys to move the cursor to the left of what appears to be the vertex; press ENTER. Right Bound? will appear in the lower left hand corner of the screen. Use the arrow keys to move the cursor to the right of what appears to be the vertex; press ENTER. Right Bound? will appear in the lower left hand corner of the screen. Use the arrow keys to move the cursor to the right of what appears to be the vertex; press ENTER. See Figure 3. The x and y values are in the lower left hand corner of the screen.
- **4.** The axis of symmetry is x = h, where h is the x-coordinate of the vertex.
- **5.** To find a point on the graph, press **TRACE**. Move the cursor with the arrow keys. The *x* and *y* values are in the lower left hand corner of the screen. See Figure 4.











11=-282+48-8=1.44

Figure 4

© 2003 BestQuest

Module 14 Lesson 2

In the equations below, find numerical estimates for the equation's vertex, axis of symmetry, and one point on the graph, which is not the vertex.

<b>1.</b> $y = x^2 - 5x + 6$	<b>2.</b> $y = 2x^2 - 3$
<b>3.</b> $y = -\frac{3}{4}x^2 - x + 1$	<b>4.</b> $y = -4x^2 + 2x + 3$
- 4	-

Module 14 Lesson 2