

$$x^2 - 10x + 24$$

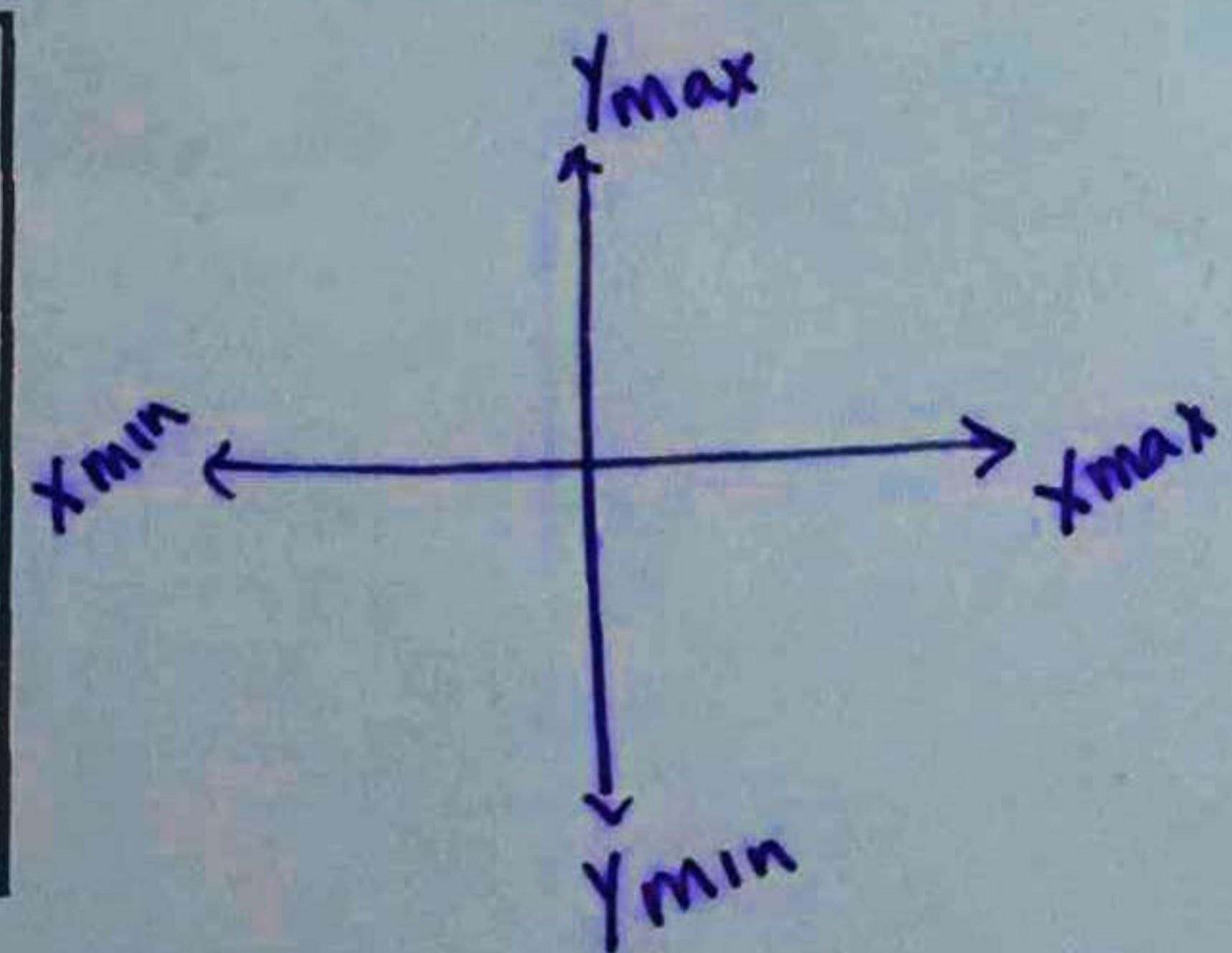
5) $y = x^2 - 10x + 24$
 Factors: $(x-6)(x-4)$
 Axis of symmetry: $x = 5$
 Vertex: $(5, -1)$
 Maximum or Minimum Value: min of -1
 Zeros: $(4, 0) + (6, 0)$
 y-intercept: $(0, 24)$
 Domain \mathbb{R} Range $y \geq -1$

7) $y = -x^2 + 6x + 8$
 Axis of symmetry: $x = 3$
 Vertex: $(3, 17)$
 Maximum or Minimum Value: Max of 17
 Zeros: $\approx -1, 7$
 y-intercept: $(0, 8)$
 Domain \mathbb{R} Range $y \leq 17$

6) $y = x^2 + 8x + 15$
 Factors: $(x+3)(x+5)$
 Axis of symmetry: $x = -4$
 Vertex: $(-4, -1)$
 Maximum or Minimum Value: min of -1
 Zeros: $x = -3, -5$
 y-intercept: $(0, 15)$
 Domain \mathbb{R} Range $y \geq -1$

8) $y = 2x^2 + 9x + 10$
 Factors:
 Axis of symmetry:
 Vertex:
 Maximum or Minimum Value:
 Zeros:
 y-intercept:
 Domain Range

- To find the Vertex on the calculator:**
- 1) $y =$ and enter the function, then Graph
 - 2) Adjust Window to see the vertex
 - 3) 2nd → Trace → 3: Minimum
 ↙ 4: Maximum
 - 4) Set Left Boundary → Enter
 - 5) Set Right Boundary → Enter
 - 6) Press Enter



7) The International Space Station has finally landed a robotic explorer on an alien solar planet to conduct various tests. The explorer launches a ball directly upward. The equation that represents the height of the ball, h , at t seconds $H(t) = -49t^2 + 147t + 10$

What is the maximum height for the ball?
 (y-value of vertex) 110.25 ft

How long will it take for the ball to reach its maximum height?
 (x-value of vertex) 1.5 sec

How long is the ball in the air?
 (Zero, x-intercept) 3 sec

Reasonable Domain: $0 \leq x \leq 3$
 Reasonable Range: $0 \leq y \leq 110.25$

8) After t seconds, a ball tossed in the air from the ground reaches a height of h feet given by the equation $h(t) = 144t - 16t^2$.

What is the height of the ball after 3 seconds?

Find the number of seconds the ball is in the air when it reaches a height of 224 feet.

What is the maximum height for the ball?

How long will it take for the ball to reach its maximum height?

How long is the ball in the air?

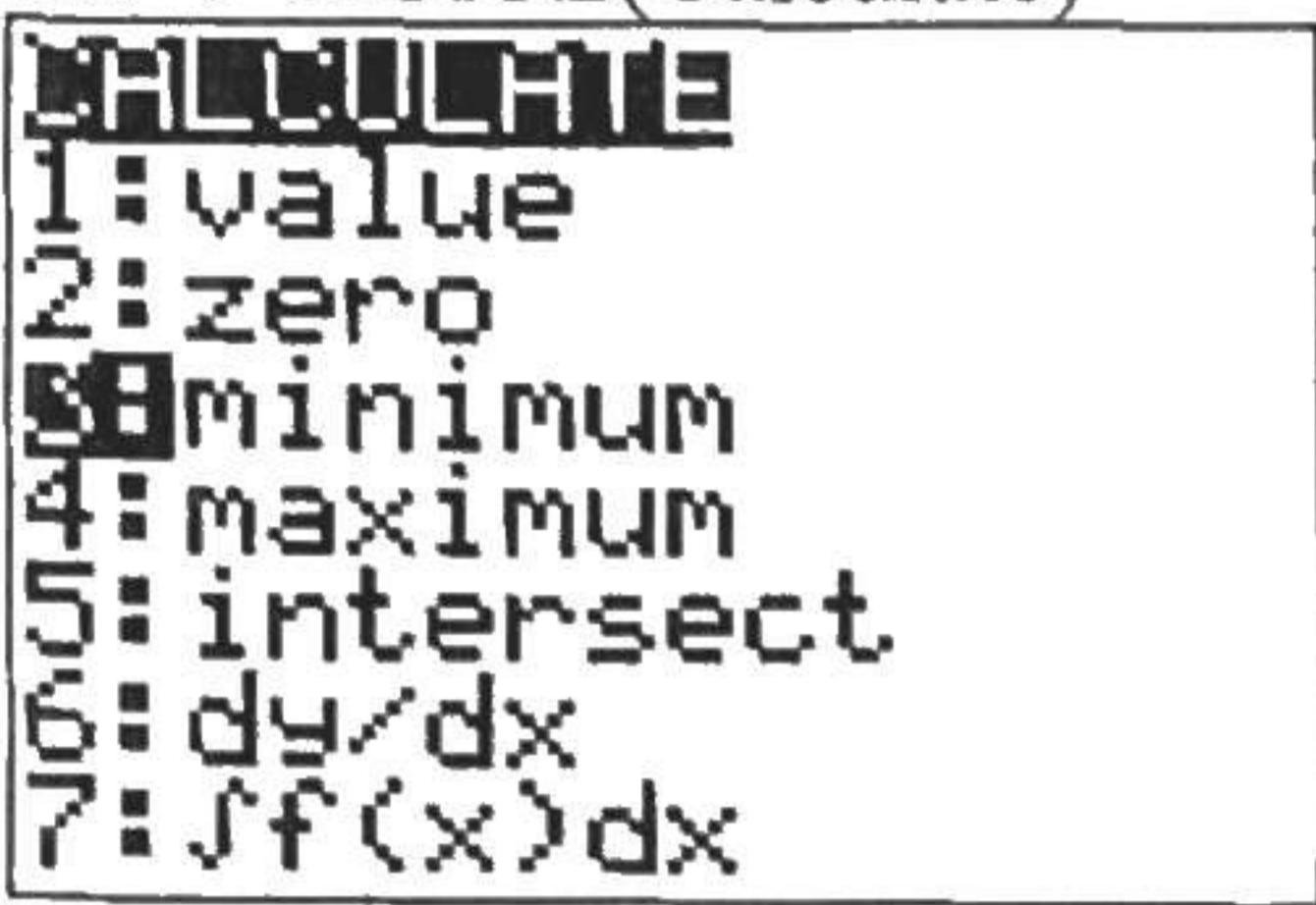
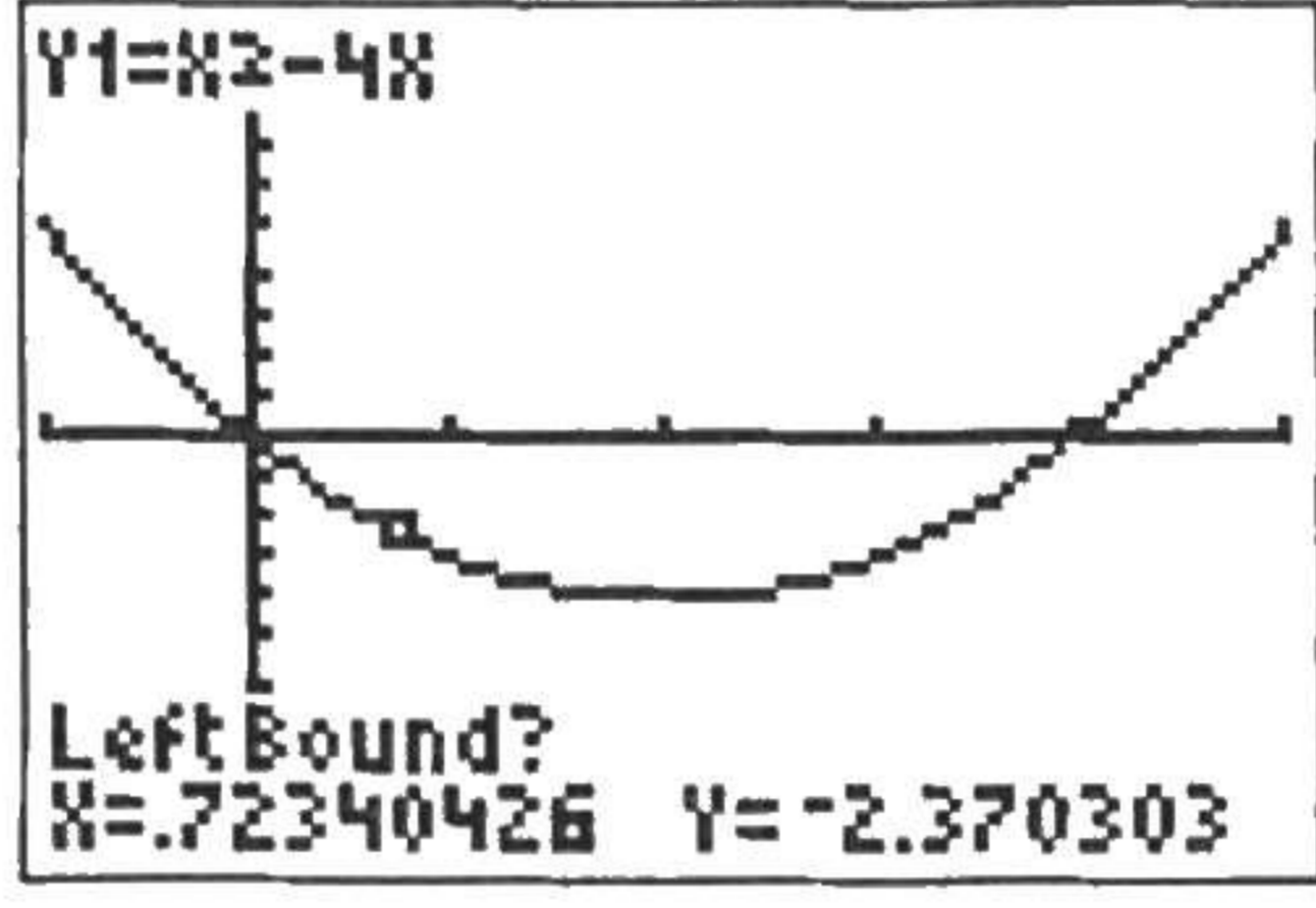
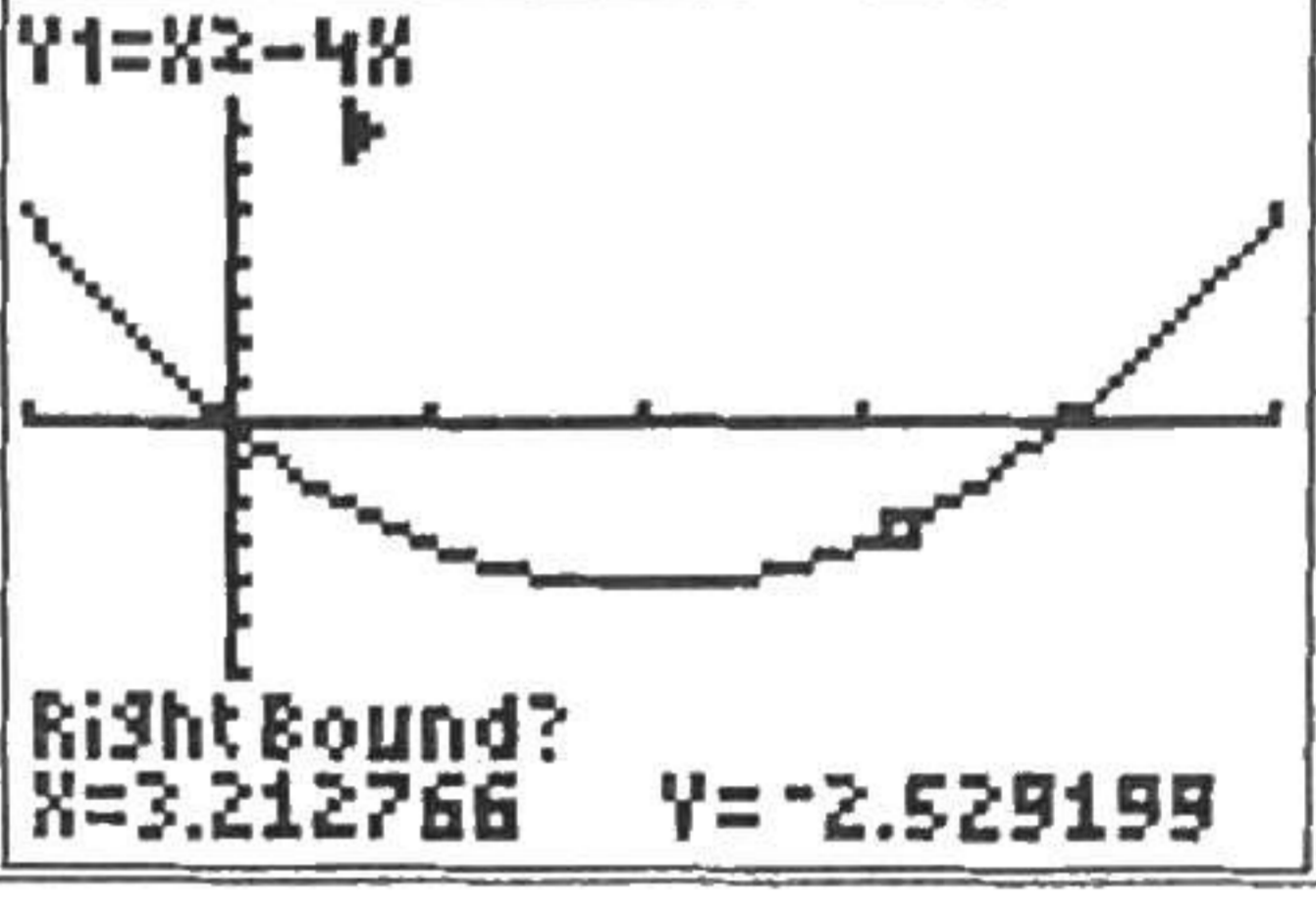
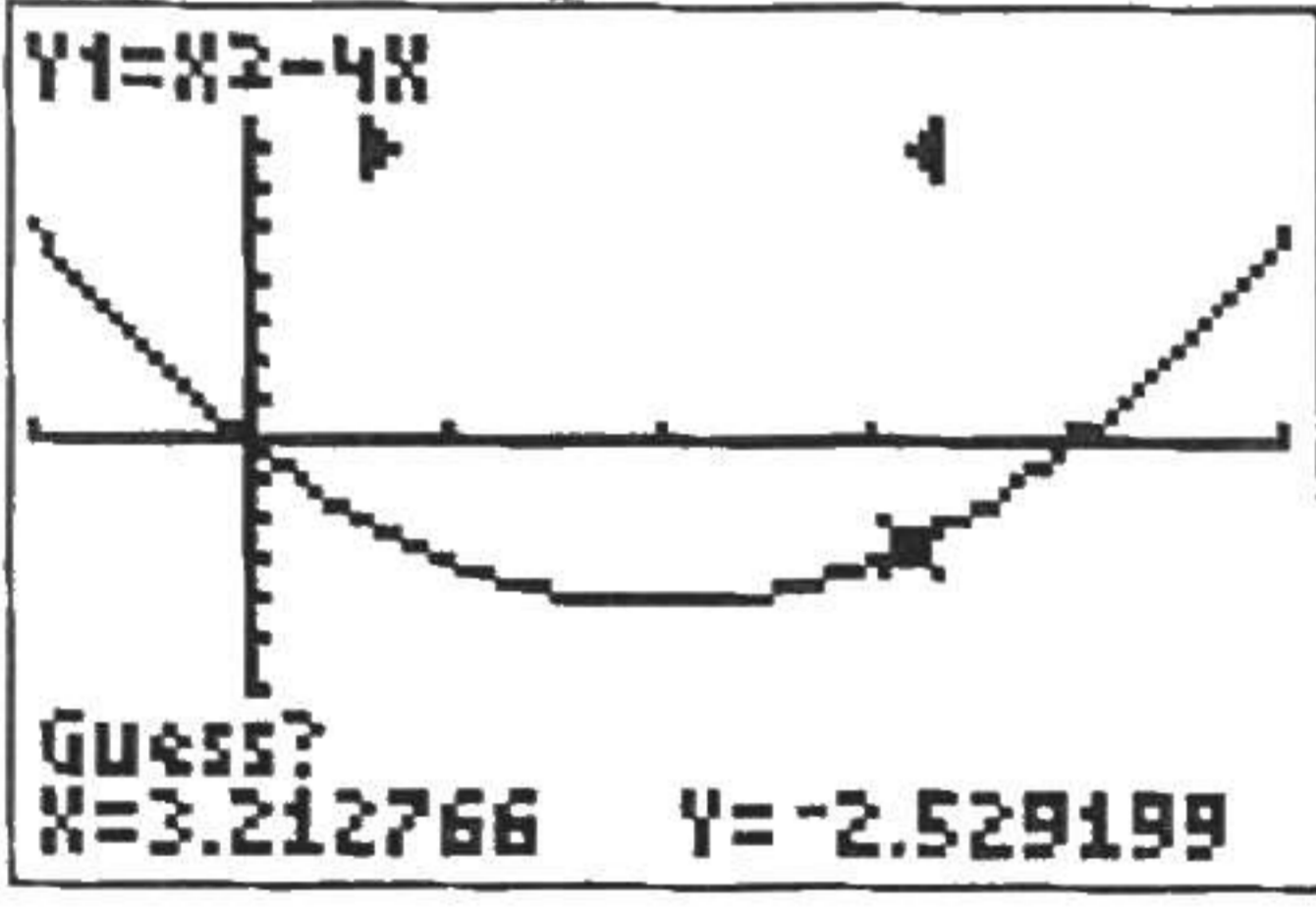
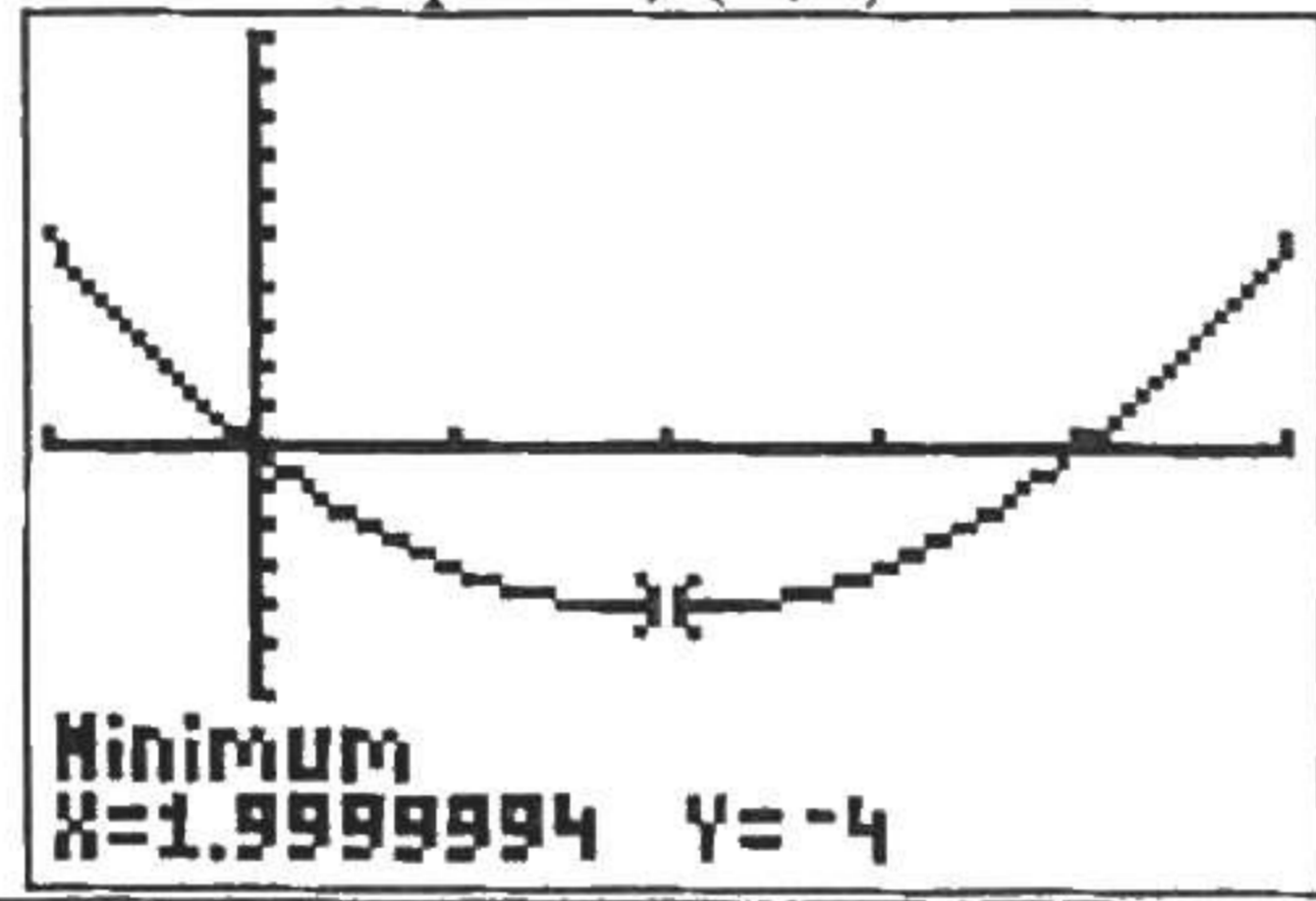
Reasonable Domain Reasonable Range

Calculator Instructions for Quadratic Functions

To Find the Vertex of A Parabola:

To find the turning point, you are looking for the minimum or maximum value of the parabola. For this problem, we will need the minimum option.

Graph the parabola.

<p>Locate Max or Min? 2nd → TRACE(Calculate)</p> 	<p>For the "left bound", choose any location to the left of the turning point. Press ENTER.</p> 	<p>An anchor for the left position will appear. For the "right bound", choose any location to the right of the turning point. Press ENTER.</p> 
<p>Press ENTER to by-pass "guess".</p> 	<p>The minimum coordinates will appear. These are the coordinates of the turning point, (2,4).</p> 	<p>Remember, when you see an answer such as 1.9999994, the actual answer is most likely 2. To verify, check the value $x = 2$ into the equation and the result will be $y = -4$.</p>

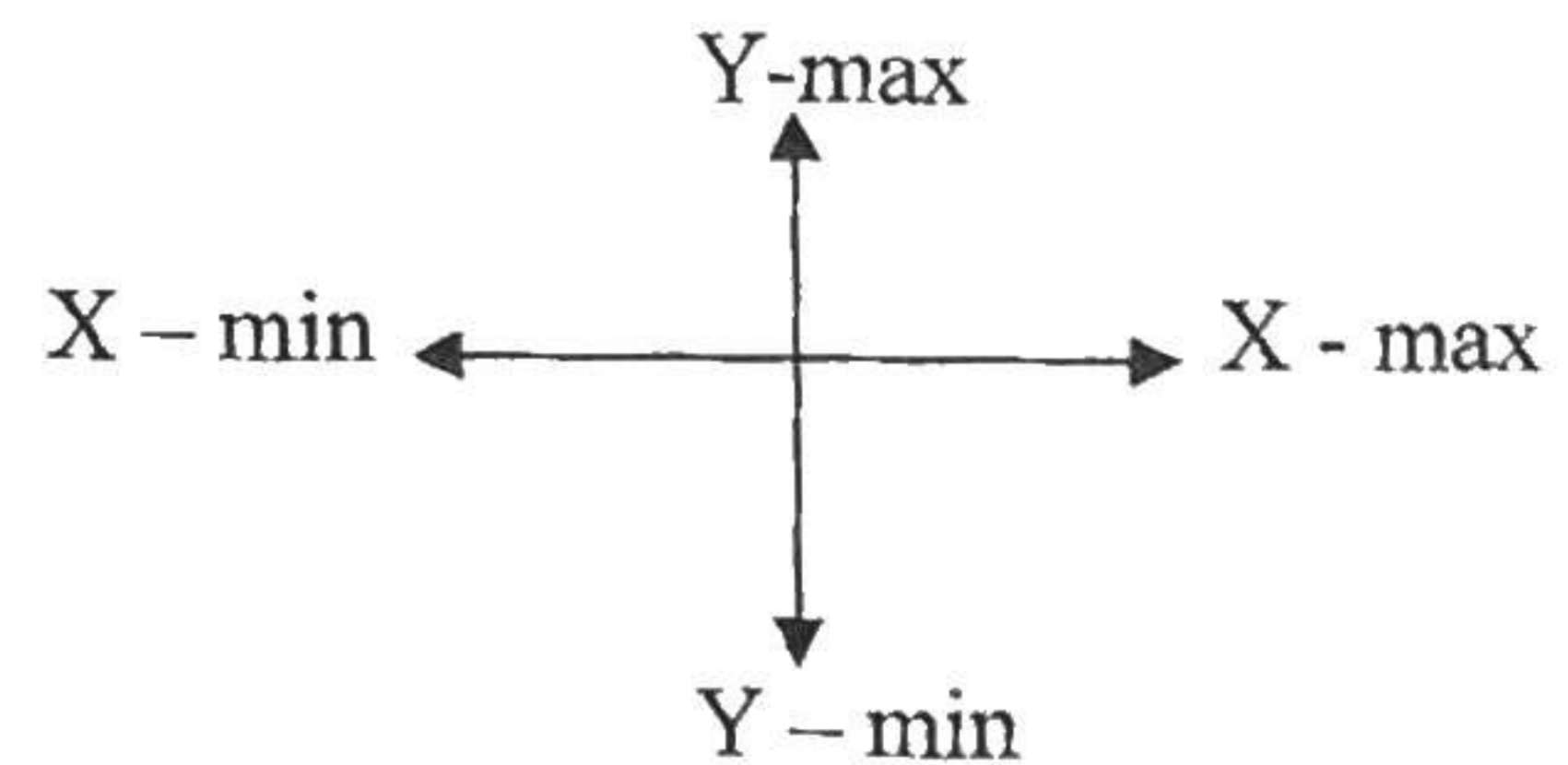
If asked for the "Value of the Maximum or Minimum point" – it is asking for the y-value of the vertex.

To Graph the parabola:

$y =$ (enter equation) → Graph

** to see the vertex, you might need to adjust your window

→ Go to **WINDOW** and make necessary adjustments



To Find the Vertex:

2nd → Trace → 3: Minimum → Adjust Left Boundary ENTER → Adjust Right boundary ENTER ENTER
 → 4: Maximum (adjust boundary using right/ left arrows, NOT up/down)