

2.1 (Con't)

$$\textcircled{1} \quad y = -x - 1 \quad \begin{matrix} (-1, 0) \\ (0, -1) \end{matrix}$$

$$\textcircled{2} \quad \begin{matrix} x^2 + y^2 = 9 & (3, 0) \\ -x^2 & (-3, 0) \\ & (0, 3) \\ & (0, -3) \end{matrix}$$

$$\sqrt{y^2} = \sqrt{9 - x^2}$$

$$y = \pm \sqrt{9 - x^2}$$

$$\textcircled{3} \quad \begin{matrix} y - x^2 = -1 \\ +x^2 & +x^2 \end{matrix}$$

$$y = x^2 - 1$$

$$\textcircled{4} \quad \begin{matrix} x = y^2 - 7 \\ +7 & +7 \end{matrix}$$

$$\sqrt{x+7} = \sqrt{y^2}$$

$$\pm \sqrt{x+7} = y$$

2.4

Use the calculator and sketch a graph of the following quadratic equations. Find the vertex and axis of symmetry.

$$\textcircled{1} \quad \underline{f(x)} = x^2 + 2x - 1$$

$$y = x^2 + 2x - 1$$

$$V: (-1, -2) \quad \text{Calc: } y = \text{2nd trace}$$

$$\text{Axis} = x = -1 \quad \begin{array}{l} 3 - \text{minimum} \\ \text{enter } x \ 3 \end{array}$$

$$\textcircled{2} \quad f(x) = -x^2 + 2x - 1$$

$$\text{Vertex: } (1, 0)$$

$$\text{Axis: } x = 1$$

Find the axis of symmetry and vertex. Sketch the graph without using a calculator.

$$\underline{\text{Axis of symmetry: } x = \frac{-b}{2a}}$$

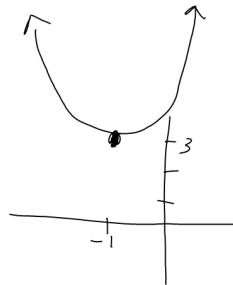
$$\textcircled{1} \quad f(x) = \frac{2}{a}x^2 + \frac{4}{b}x + \frac{5}{c} \quad \begin{array}{l} a = 2 \\ b = 4 \\ c = 5 \end{array}$$

$$\text{Axis: } x = \frac{-(4)}{2(2)} = \frac{-4}{4} = -1 \quad \begin{array}{l} a = 2 \\ b = 4 \\ c = 5 \end{array}$$

$$\begin{aligned} f(-1) &= 2(-1)^2 + 4(-1) + 5 \\ &= 2(1) - 4 + 5 \\ &= 2 - 4 + 5 \\ &= 3 \end{aligned}$$

$$\text{Axis: } x = -1$$

$$\text{Vertex: } (-1, 3)$$



Find the maximum or minimum function value and state the range.

$$\textcircled{1} f(x) = 2x^2 + 4x + 5 \quad \cup \quad \text{min.}$$

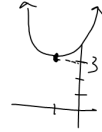
$$x = \frac{-b}{2a} = \frac{-4}{2(2)} = \frac{-4}{4} = -1$$

$$f(-1) = 2(-1)^2 + 4(-1) + 5$$

$$f(-1) = 2(1) - 4 + 5$$

$$f(-1) = 2 - 4 + 5$$

$$f(-1) = 3$$



minimum: $(-1, 3)$

Range: $y \geq 3$

y-values $[3, \infty)$

Find the range.

$$\textcircled{1} f(x) = x^2 - 2x - 5$$

$$x = \frac{-b}{2a} = \frac{-(-2)}{2(1)} = \frac{2}{2} = 1$$

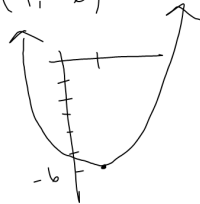
$$x = 1$$

$$f(1) = (1)^2 - 2(1) - 5$$

$$f(1) = 1 - 2 - 5$$

$$f(1) = -6$$

$(1, -6)$



R: $y \geq -6$

$[-6, \infty)$