

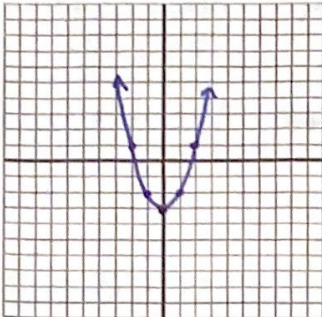
Section 2.4 WS

Name KEY

Graph the quadratic function, then state the axis of symmetry.

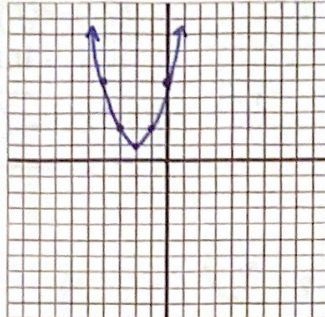
1. $f(x) = x^2 - 3$ $V: (0, -3)$

Axis of Symmetry: $x = 0$



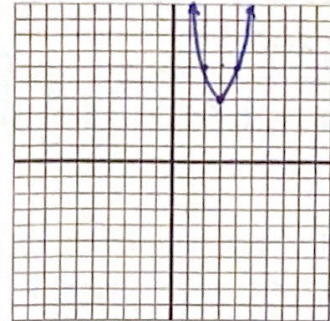
2. $f(x) = (x+2)^2 + 1$ $V: (-2, 1)$

Axis of Symmetry: $x = -2$



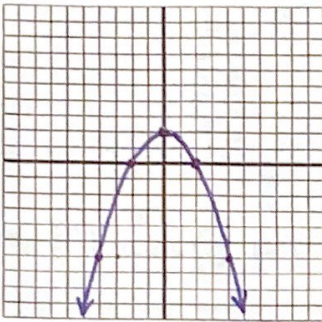
3. $f(x) = 2(x-3)^2 + 4$ $V: (3, 4)$

Axis of Symmetry: $x = 3$



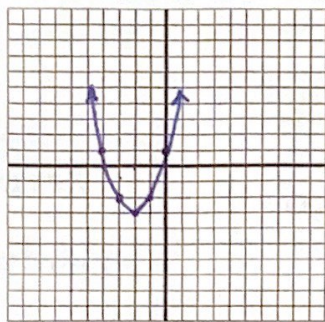
4. $g(x) = -\frac{1}{2}x^2 + 2$ $V: (0, 2)$

Axis of Symmetry: $x = 0$



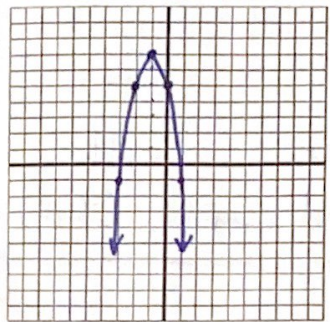
5. $f(x) = x^2 + 4x + 1$ $V: (-2, -3)$

Axis of Symmetry: $x = -2$



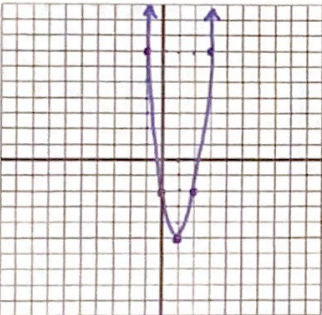
6. $h(x) = -2x^2 - 4x + 5$ $V: (-1, 7)$

Axis of Symmetry: $x = -1$



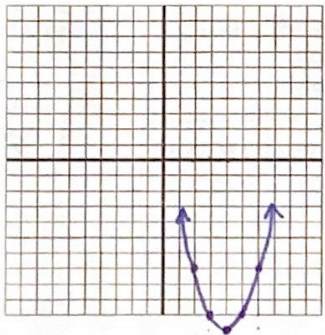
7. $g(x) = 3(x-1)^2 - 5$ $V: (1, -5)$

Axis of Symmetry: $x = 1$



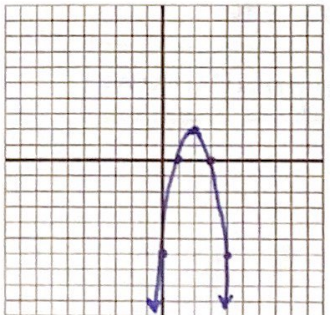
8. $f(x) = x^2 - 8x + 5$ $V: (4, -11)$

Axis of Symmetry: $x = 4$



9. $h(x) = -2x^2 + 8x - 6$ $V: (2, 2)$

Axis of Symmetry: $x = 2$



Write the quadratic function in vertex form.

10. $h(x) = x^2 - 10x$

$$x = \frac{10}{2} = 5$$

$$h(x) = 5^2 - 10(5)$$

$$h(x) = -25$$

$$h(x) = (x-5)^2 - 25$$

11. $f(x) = x^2 - 10$

$$x = \frac{0}{2} = 0$$

$$f(x) = -10$$

$$f(x) = x^2 - 10$$

12. $g(x) = -x^2 + 6x + 1$

$$x = \frac{-6}{-2} = 3$$

$$g(x) = -(3)^2 + 6(3) + 1$$

$$g(x) = 10$$

$$g(x) = -(x-3)^2 + 10$$

13. $h(x) = 2x^2 - 3x + 7$

$$x = \frac{3}{4}$$

$$h(x) = 2\left(\frac{3}{4}\right)^2 - 3\left(\frac{3}{4}\right) + 7$$

$$h(x) = \frac{47}{8}$$

$$h(x) = 2\left(x - \frac{3}{4}\right)^2 + \frac{47}{8}$$

Find the range of the quadratic function.

14. $f(x) = x^2 - 2x - 1$ $x = 1$ $f(x) = -2$ ↗

$$\{y \mid y \geq -2\} \text{ or } [-2, \infty)$$

15. $h(x) = -x^2 - 6x - 2$ $x = -3$ $h(x) = 7$ ↘

$$\{y \mid y \leq 7\} \text{ or } (-\infty, 7]$$

Find the zeros of f and the x -intercepts of the graph of f .

16. $f(x) = x^2 + 2x - 24$

$$\begin{matrix} \wedge \\ 6-4 \end{matrix}$$

Zeros: $-6, 4$

x -intercepts: $(-6, 0)$ and $(4, 0)$

17. $h(x) = 2x^2 + 11x + 12$

$$\begin{matrix} \wedge \\ 24 \\ \frac{8}{2} \frac{3}{2} \\ 4 \end{matrix}$$

Zeros: $-4, -\frac{3}{2}$

x -intercepts: $(-4, 0)$ and $(-\frac{3}{2}, 0)$

Find the minimum or maximum value of the function. State whether this value is a minimum or a maximum.

18. $g(x) = x^2 + 8x$ ↗ min

$$x = \frac{-8}{2} = -4$$

$$g(x) = (-4)^2 + 8(-4)$$

$$g(x) = -16$$

$-16, \text{ minimum}$

19. $f(x) = -x^2 + 6x + 2$ ↘ max

$$x = \frac{-6}{-2} = 3$$

$$f(x) = -9 + 18 + 2$$

$$f(x) = 11$$

$11, \text{ maximum}$

20. $f(x) = 2x^2 + 3x + 1$ ↗ min

$$x = \frac{-3}{4}$$

$$f(x) = \frac{-1}{8}$$

$-\frac{1}{8}, \text{ min}$

21. $g(x) = 5x^2 - 11$ ↗ min

$$x = \frac{0}{10} = 0$$

$$g(x) = -11$$

$-11, \text{ min}$