Honors Math 2

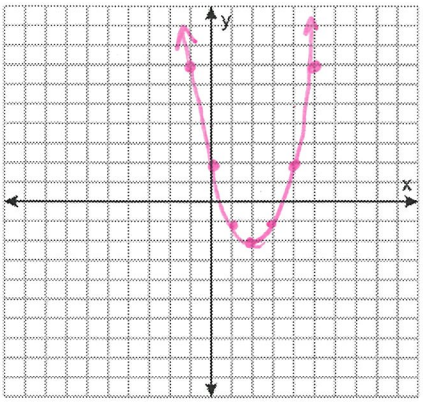
3.2: graphing quadratics

Name Key

Period_____ Date_____

Graph. (show a minimum of 5 points)

1. $y = (x-2)^2 + 2$



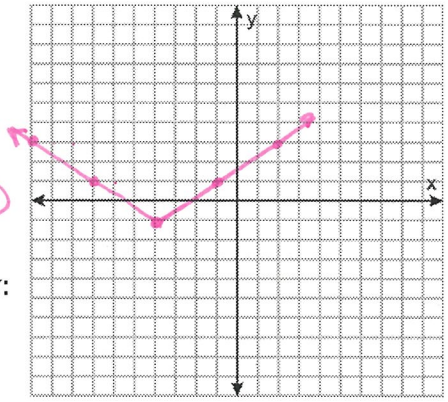
Domain: $\mathbb{R}$

Range: $y \geq -2$

Vertex: Max/Min (2, 2)

Axis of symmetry: $x = 2$

2. $y = \frac{2}{3}|x+4|^2 - 1$



Domain: $\mathbb{R}$

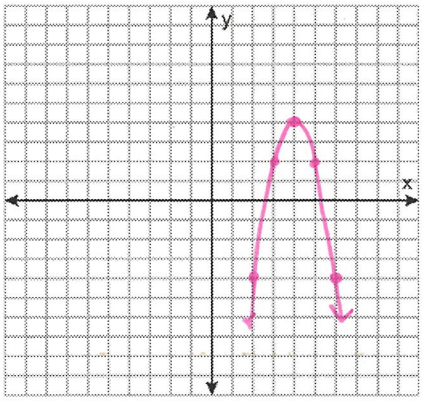
Range: $[-1, \infty)$

Vertex: Max/Min (-4, -1)

Axis of symmetry: $x = -4$

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

$1(-2)$
$3(-2)$
$5(-2)$



Domain: $\mathbb{R}$

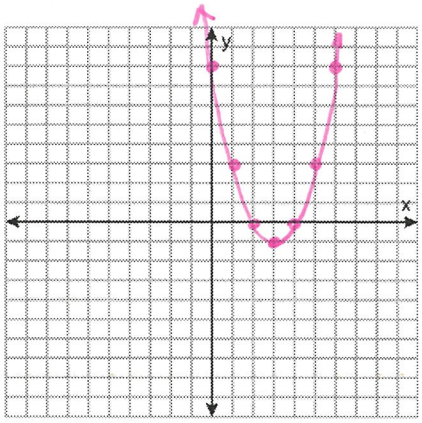
Range: $(-\infty, 4]$

Vertex: Max/Min (4, 4)

Axis of symmetry: $x = 4$

4. $y = x^2 - 6x + 8$

$x = \frac{6}{2(1)} = 3$



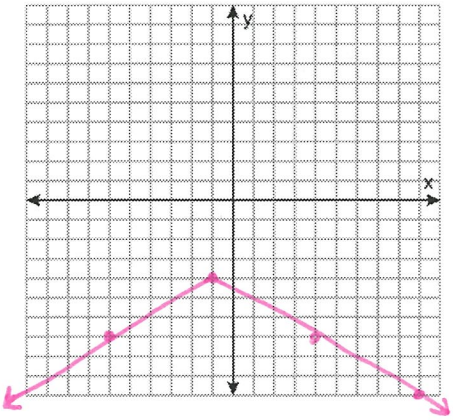
Domain: $\mathbb{R}$

Range: $y \geq -1$

Vertex: Max/Min (3, -1)

Axis of symmetry: $x = 3$

5. $y = -\frac{3}{5}|x+1| - 4$



Domain: $\mathbb{R}$

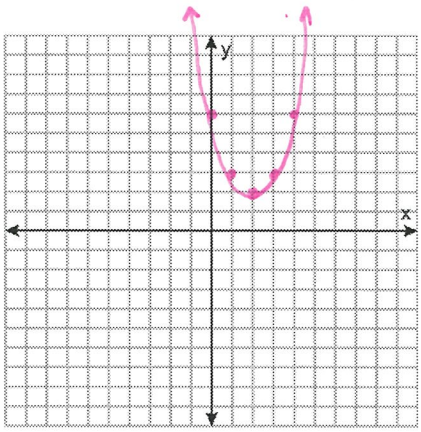
Range: $y \leq -4$

Vertex: Max/Min (-1, -4)

Axis of symmetry: $x = -1$

6. $y = x^2 - 4x + 6$

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



Domain: $\mathbb{R}$

Range: $[2, \infty)$

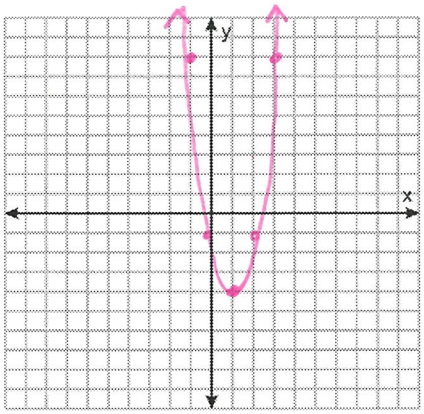
Vertex: Max/Min (2, 2)

Axis of symmetry: $x = 2$

7. $f(x) = 3x^2 - 6x - 1$

$x = \frac{6}{2(3)} = 1$

$1(3)$
$3(3)$
$5(3)$



Domain: $\mathbb{R}$

Range: $[-4, \infty)$

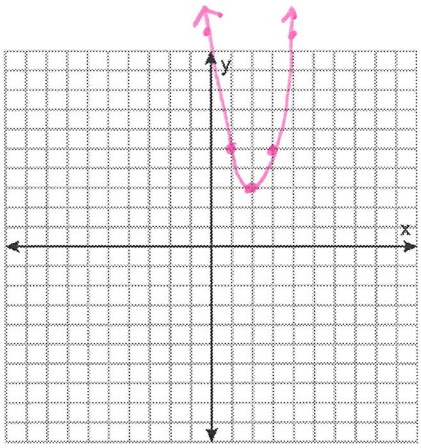
Vertex: Max/Min (circled: Min)

$(1, -4)$

Axis of symmetry: $x = 1$

8. $f(x) = 2x^2 - 8x + 11$

$x = \frac{8}{2(2)} = 2$



Domain: $\mathbb{R}$

Range: $y \geq 3$

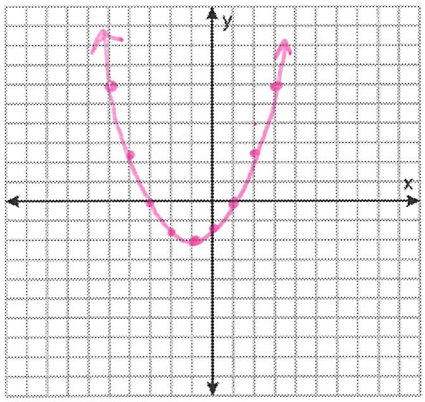
Vertex: Max/Min (circled: Min)

$(2, 3)$

Axis of symmetry: $x = 2$

9. $f(x) = \frac{1}{2}(x+1)^2 - 2$

$1(1/2) = .5$
$3(1/2) = 1.5$
$5(1/2) = 2.5$
$7(1/2) = 3.5$



Domain: $\mathbb{R}$

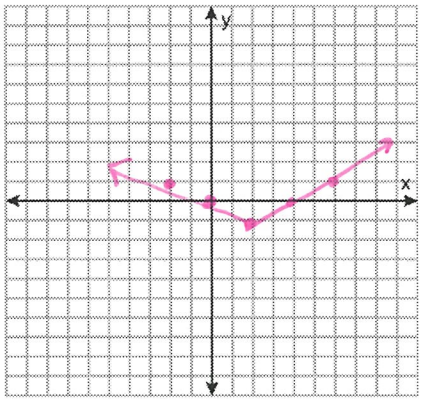
Range: $y \geq -1$

Vertex: Max/Min (circled: Min)

$(-1, -2)$

Axis of symmetry: $x = -1$

10. $f(x) = \frac{1}{2}|x-2|^2 - 1$



Domain: $\mathbb{R}$

Range: $[2, \infty)$

Vertex: Max/Min (circled: Min)

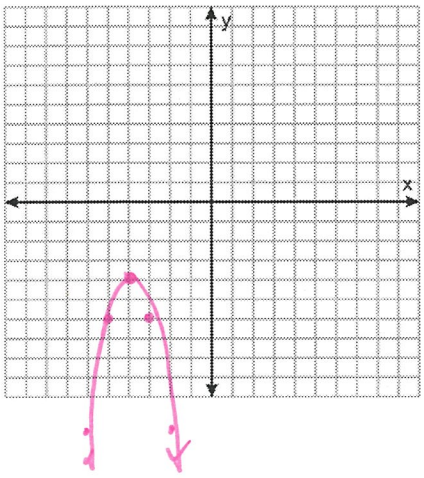
$(2, -1)$

Axis of symmetry: $x = 2$

11. $f(x) = -2x^2 - 16x - 36$

$x = \frac{16}{2(-2)} = -4$

$1(-2)$
$3(-2)$
$5(-2)$



Domain: $\mathbb{R}$

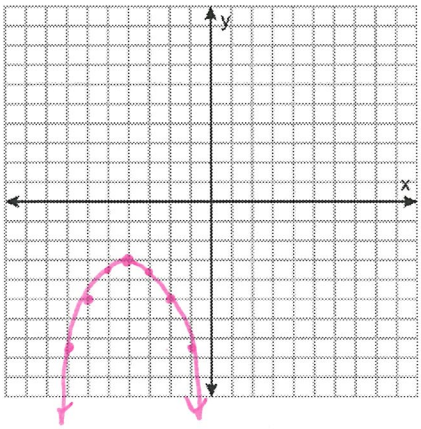
Range: $(-\infty, -4]$

Vertex: Max/Min (circled: Max)

$(-4, -4)$

Axis of symmetry: $x = -4$

12. $y = -\frac{1}{2}(x+4)^2 - 3$



Domain: $\mathbb{R}$

Range: $y \leq -3$

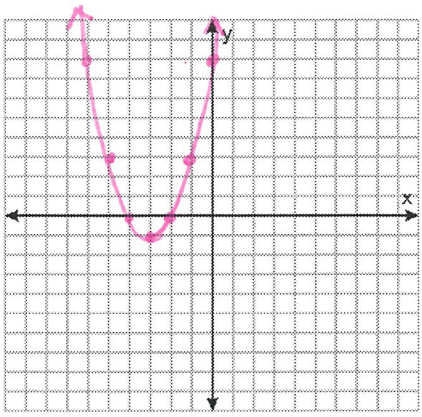
Vertex: Max/Min (circled: Max)

$(-4, -3)$

Axis of symmetry: $x = -4$

13. $y = x^2 + 6x + 8$

$x = \frac{-6}{2(1)} = -3$



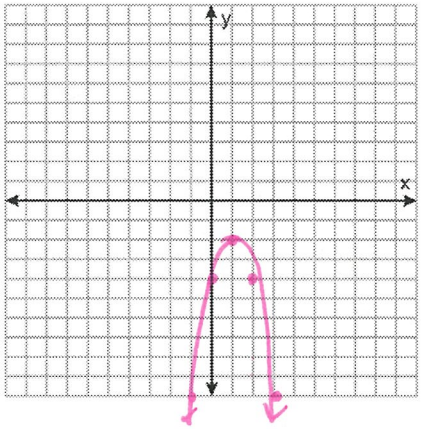
Domain: $\mathbb{R}$

Range: $y \geq -1$

Vertex: Max/Min $(-3, -1)$

Axis of symmetry: $x = -3$

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



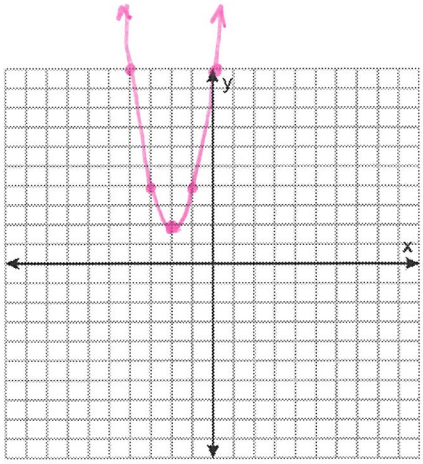
Domain: $\mathbb{R}$

Range: $(-\infty, -2]$

Vertex: Max/Min $(1, -2)$

Axis of symmetry: $x = 1$

15. $y = 2(x+2)^2 + 2$



Domain: $\mathbb{R}$

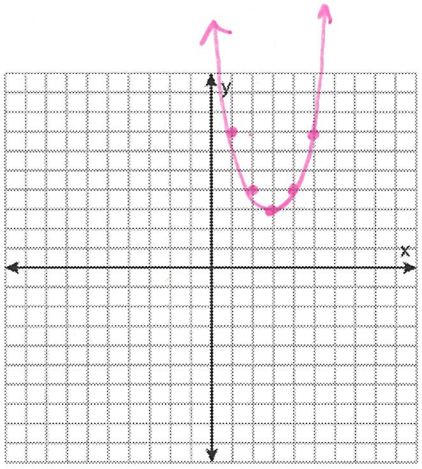
Range: $y \geq 2$

Vertex: Max/Min $(-2, 2)$

Axis of symmetry: $x = -2$

16. $y = x^2 - 6x + 12$

$x = \frac{6}{2(1)} = 3$



Domain: $\mathbb{R}$

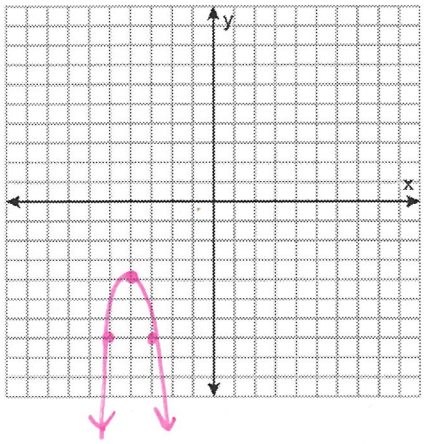
Range: $[3, \infty)$

Vertex: Max/Min $(3, 3)$

Axis of symmetry: $x = 3$

17. $f(x) = -3x^2 - 24x - 52$

$x = \frac{24}{2(-3)} = -4$



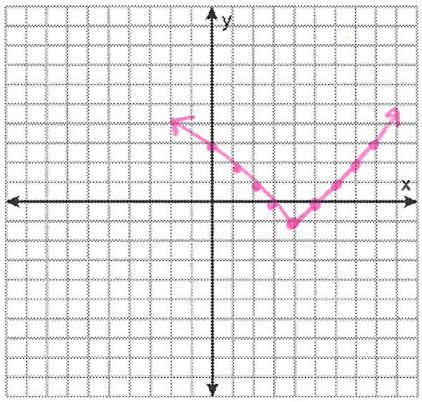
Domain: $\mathbb{R}$

Range: $(-\infty, -4]$

Vertex: Max/Min $(-4, -4)$

Axis of symmetry: $x = -4$

18. $y = |x-4|^2 - 1$



Domain: $\mathbb{R}$

Range: $y \geq -1$

Vertex: Max/Min $(4, -1)$

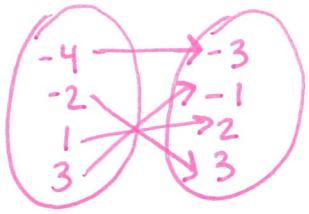
Axis of symmetry: $x = 4$

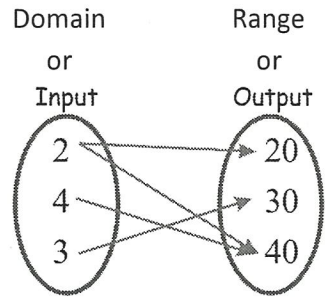
Identify the domain and range of the given relation. Then represent the relation as a mapping diagram.

19. $(-2, 3), (1, 2), (3, -1), (-4, -3)$

D: $\{-4, -2, 1, 3\}$

R: $\{-3, -1, 2, 3\}$



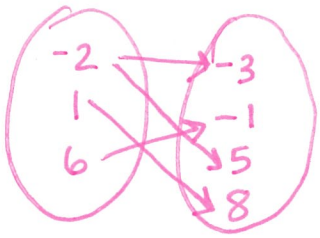


Example of mapping diagram

20. $(6, -1), (-2, -3), (1, 8), (-2, 5)$

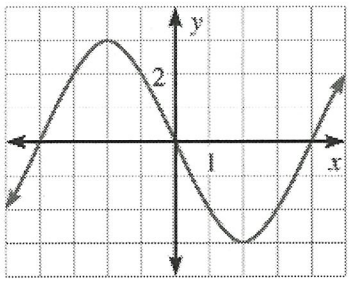
D: $\{-2, 1, 6\}$

R: $\{-3, -1, 5, 8\}$



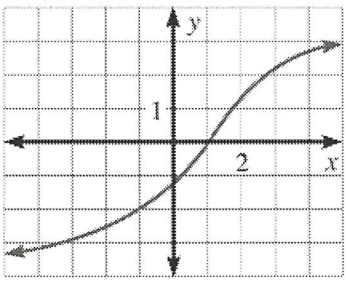
Use the vertical line test to tell whether the relation is a function.

21.



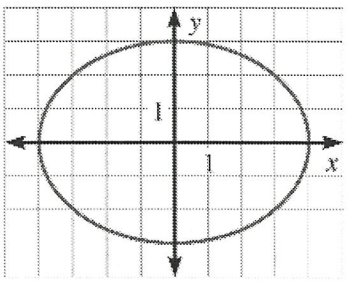
yes function

22.



yes function

23.



No not a function

Name the type of function. Then evaluate the function for the given value of x.

24. $f(x) = x + 15$; $f(-4)$

Line

$f(-4) = 11$

25. $f(x) = |x + 15|$; $f(-4)$

absolute value

$f(-4) = 11$

26. $f(x) = (x + 15)^2$; $f(-4)$

quadratic (parabola)

$f(-4) = 121$

Solve the inequality. Then graph the solutions on a number line.

27. $4 - x < 3$

$-x < -1$

$x > 1$

28. $-7 < 6x - 1 < 5$

$+1 \quad +1 \quad +1$

$-6 < 6x < 6$

$-1 < x < 1$

29. $x - 2 \leq 1$ *or* $4x + 3 \geq 19$

$x \leq 3$ or $4x \geq 16$

$x \geq 4$