Homework 2.1: Features of Functions

Name: Key!

Math 3

1. Determine whether the relation is a function. If it is not a function, circle the ordered pairs that cause it not to be a function.

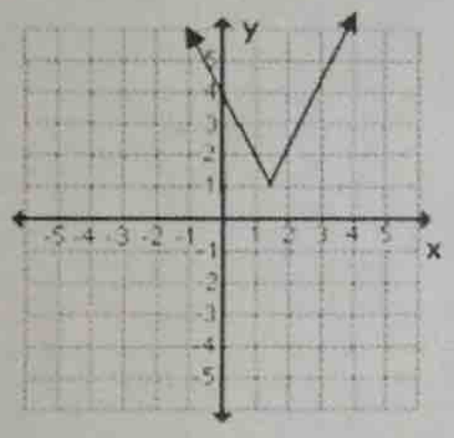
A. Yes **No** $\{(-2,2),(0,5),(1,6),(1,7),(2,-1),(3,2)\}$ x-values repeat

B. **Yes** No $\{(0,1),(2,-1),(3,2),(4,2),(5,3),(-5,1)\}$

C. Yes **No** $\{(0,-5),(1,3),(2,2),(0,4),(-5,6),(3,4)\}$ x-values repeat

2. Which of the following graphs represent functions? Circle your answers. If it is a function, state the domain and range. If the graph is not included, make a table and graph the function by hand.

A. $y = |2x - 3| + 1$

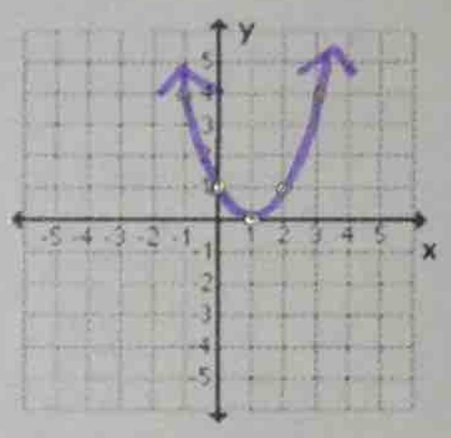


Function

Domain: $(-\infty, \infty)$

Range: $[1, \infty)$

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



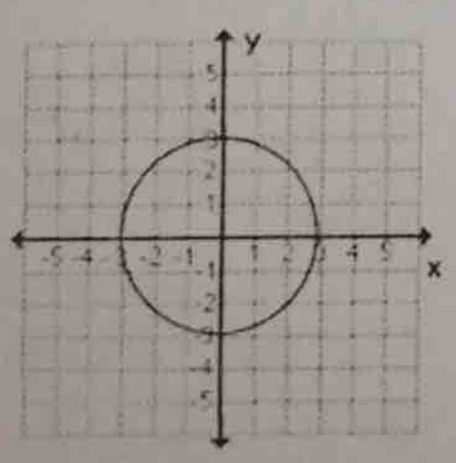
Function

Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

x	y
-1	4
0	1
1	0
2	1
3	4

C. $x^2 + y^2 = 9$

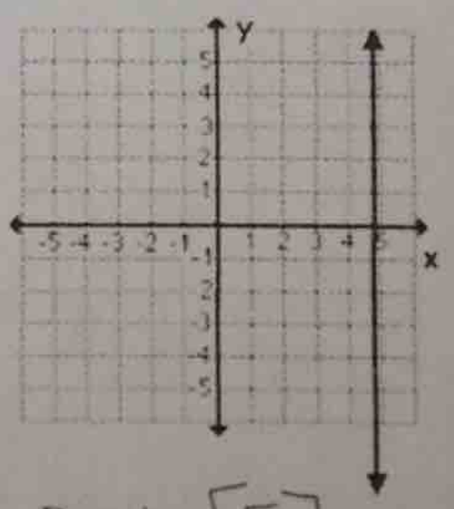


Not a Function

Domain: $[-3, 3]$

Range: $[-3, 3]$

D. $x = 5$



Not a function

Domain: $[5]$

Range: $(-\infty, \infty)$

3. Graph the following functions, and then find each of the following.

a) **Absolute Value:** $f(x) = -|x| + 7$ Shape: √

Vertex

x	-3	-2	-1	0	1	2	3	4
y	4	5	6	7	6	5	4	3

x-intercept: (-7, 0) and (7, 0)

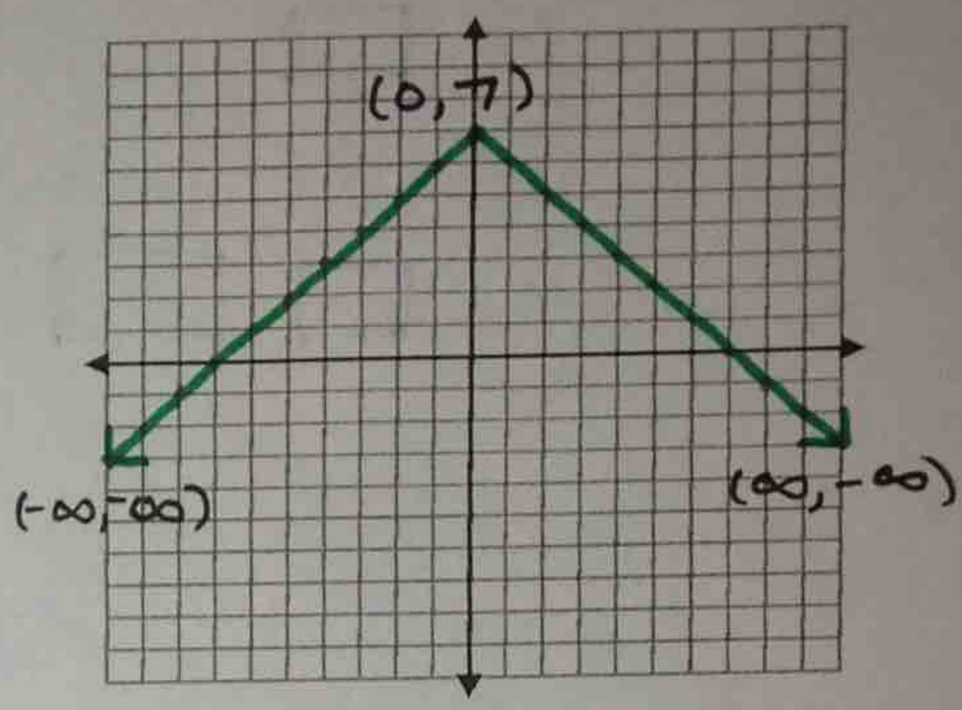
y-intercept: (0, 7)

Max or Min: max

Vertex: (0, 7)

Interval Increasing: (-∞, 0)

Interval Decreasing: (0, ∞)



b) **Quadratic:** $f(x) = -(x + 1)^2 - 7$ Shape: ∪

Vertex

x	-4	-3	-2	-1	0	1	2
y	-16	-11	-8	-7	-8	-11	-16

x-intercept: None

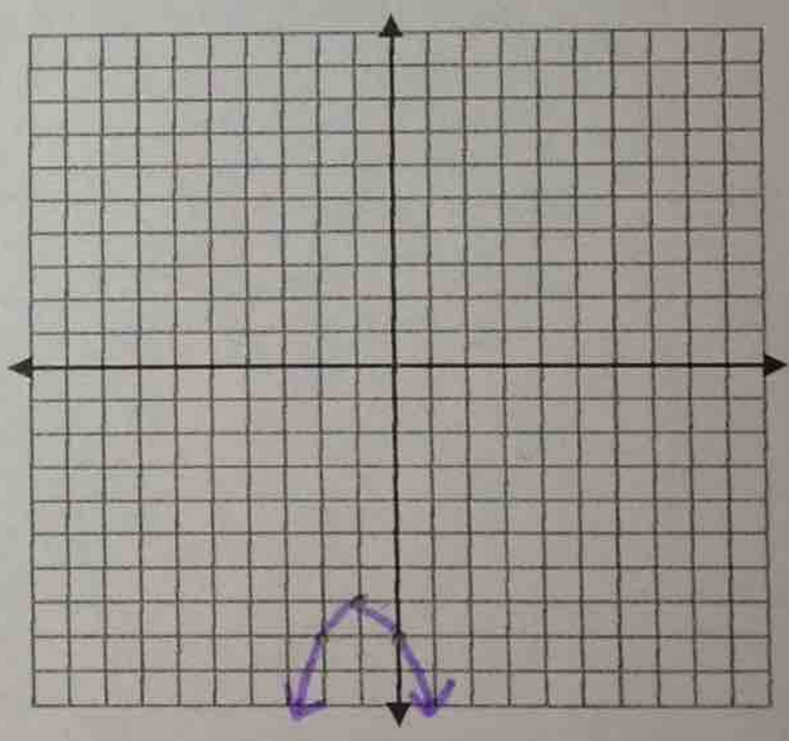
y-intercept: (0, -8)

Max or Min: max

Vertex: (-1, -7)

Interval Increasing: (-∞, -1)

Interval Decreasing: (-1, ∞)



For questions 3a-3b:

- What similarities do you see between the vertex and the equation?
  The vertex uses the same numbers that the equation uses.
- Do you believe the vertex has any bearing on where the graph is located? Explain your reasoning.
  yes, it moves the graph in a certain direction.
- What part of the equation do you think gives the graph its shape?
  The ^2 or the absolute value bars