# 4-4 Graphing a Function Rule

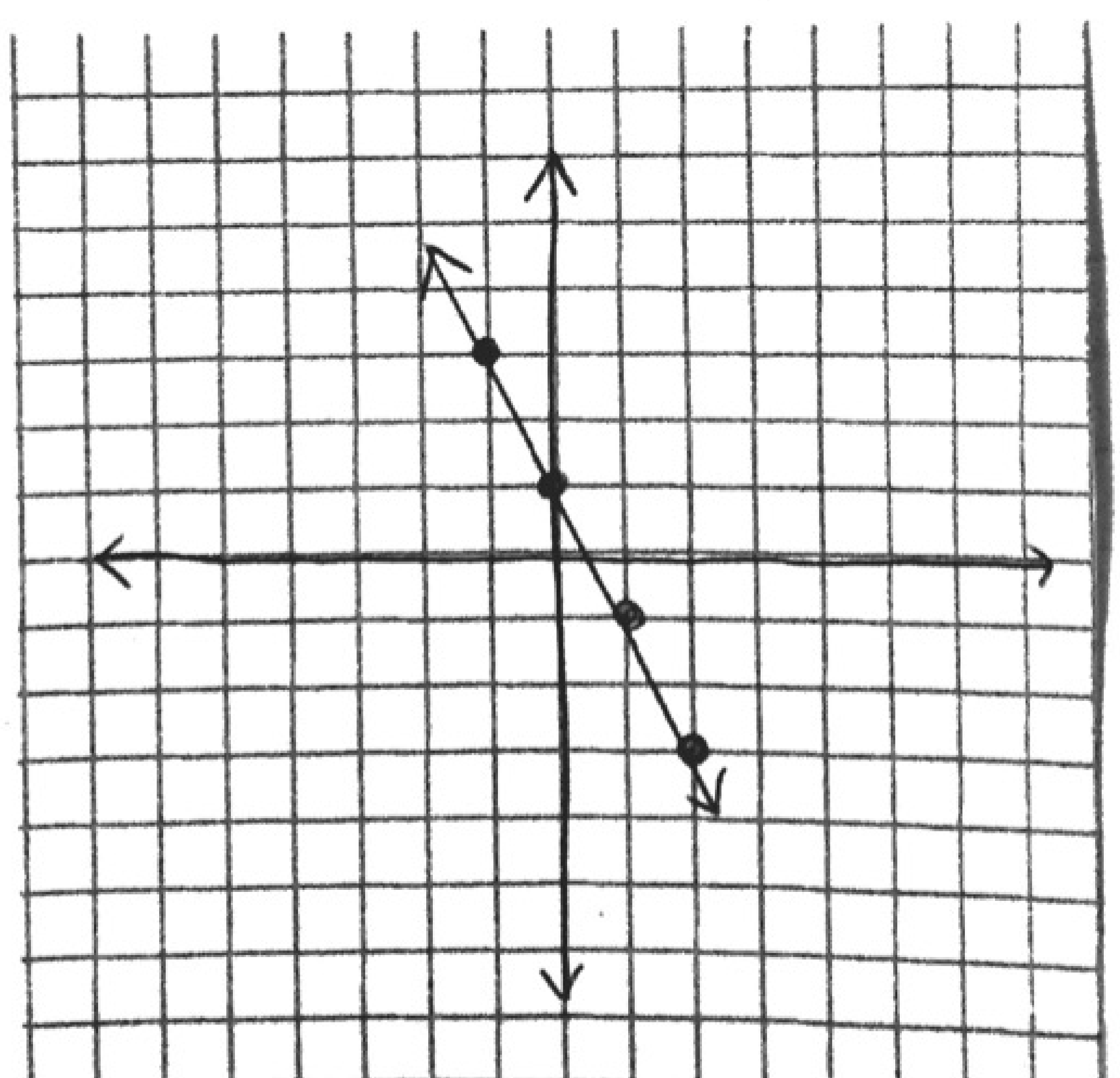
What is the graph of the function rule $y = -2x + 1$?

Method 1: Make a table of values

| x | $y = -2x + 1$ | (x, y) |
|---|---|---|
| -1 | $y = -2(-1) + 1$ | (-1, 3) |
| 0 | $y = -2(0) + 1$ | (0, 1) |
| 1 | $y = -2(1) + 1$ | (1, -1) |
| 2 | $y = -2(2) + 1$ | (2, -3) |

* you can always choose these values for x.

Graph the ordered pairs.



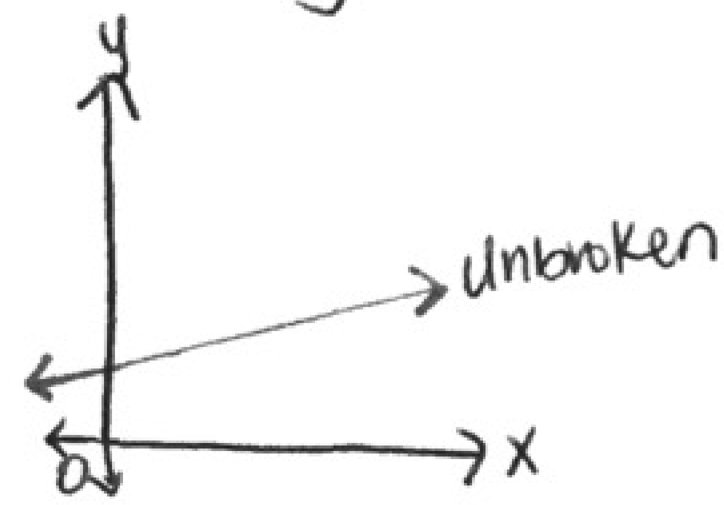
Method 2:
Name slope (m) and y-intercept (b) and graph.

$m = \frac{-2}{1}$ $b = 1$

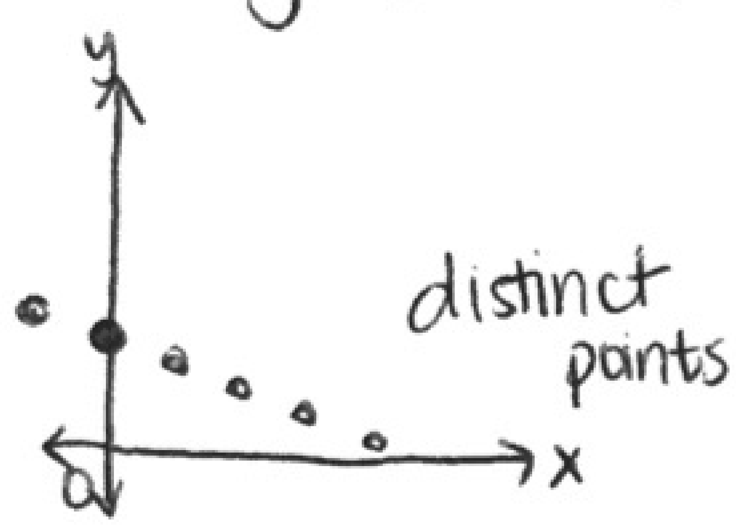
↑ down 2, right 1

↑ begin on y-axis

Continuos graph: A graph that is unbroken.




Discrete graph: composed of distinct isolated points.



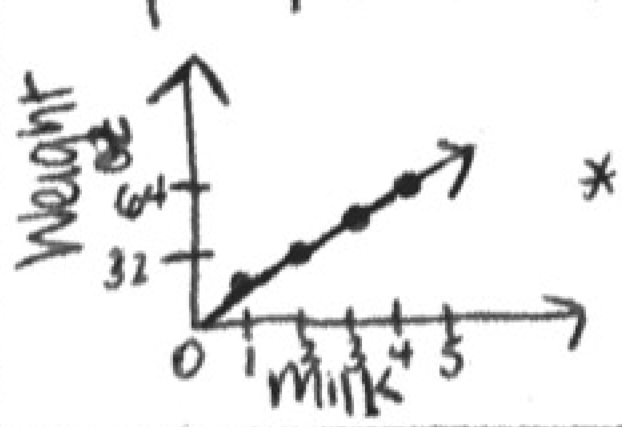

## Example: Identifying Continuous and Discrete Graphs

A local cheese maker is making cheddar cheese to sell at a farmer's market. The amout of milk used to make the cheese and the price at which he sells the cheese are shown. Write a function for each situation. Graph each function. Is the graph continuous or discrete?

- 1 gallon of milk makes 16 oz of cheese
- Each wheel of cheddar cheese costs $9.

* The weight w of cheese, in oz, depends on the # of gallons m of milk used. So $w = 16m$.

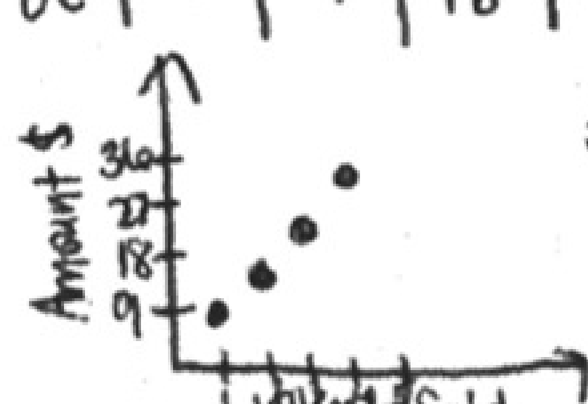
| m | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| w | 0 | 16 | 32 | 48 | 64 |




* Any amount of milk makes sense, so connect the points - continuous!

* The amount a of money made from selling cheese depends on the # of wheels sold. $a = 9n$

| n | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| a | 0 | 9 | 18 | 27 | 36 |




* He can only sell whole wheels of cheese. The graph is discrete.

# 4-4 Graphing a Function Rule

What is the graph of each function rule?

(A) $y = |x| - 4$

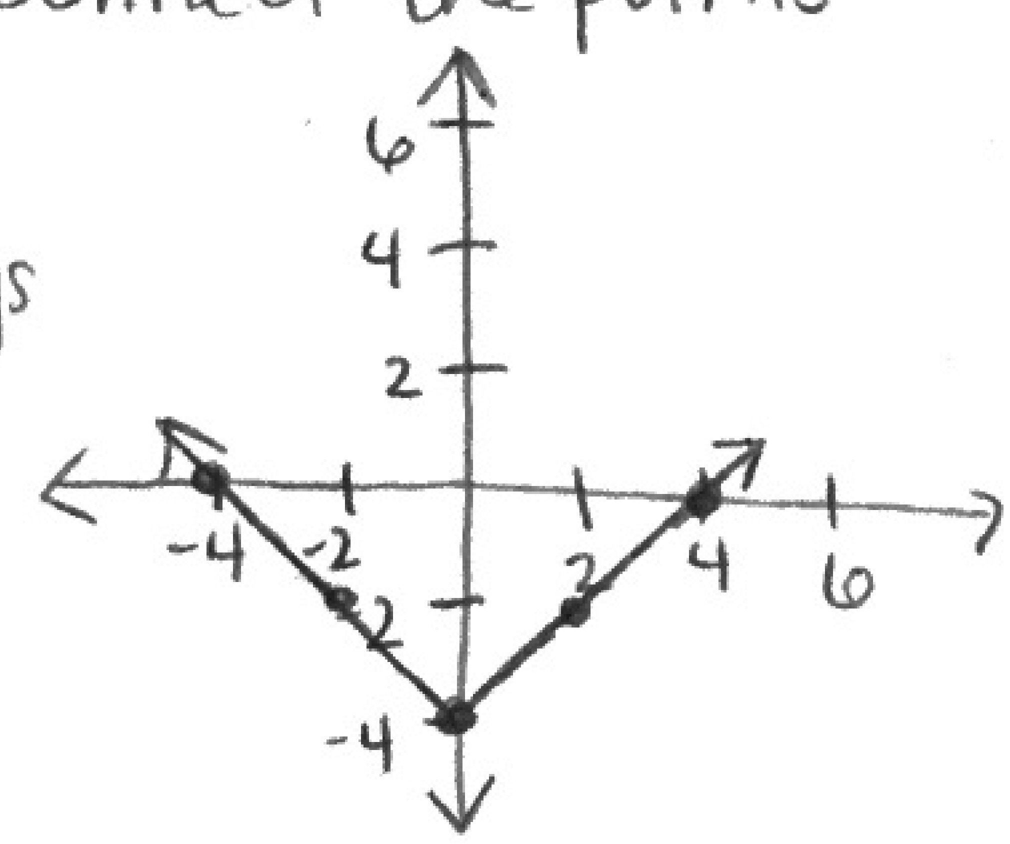
Step 1: Make a table of values

| x | $y = \|x\| - 4$ | (x, y) |
|---|---|---|
| -4 | $y = \|-4\| - 4 = 0$ | (-4, 0) |
| -2 | $y = \|-2\| - 4 = -2$ | (-2, -2) |
| 0 | $y = \|0\| - 4 = -4$ | (0, -4) |
| 2 | $y = \|2\| - 4 = -2$ | (2, -2) |
| 4 | $y = \|4\| - 4 = 0$ | (4, 0) |

Include 0 as well as negative and positive values so that you can see the shape of the graph

Step 2: Graph the ordered pairs. Connect the points

*Absolute value graphs will always be a "V" shaped graph.

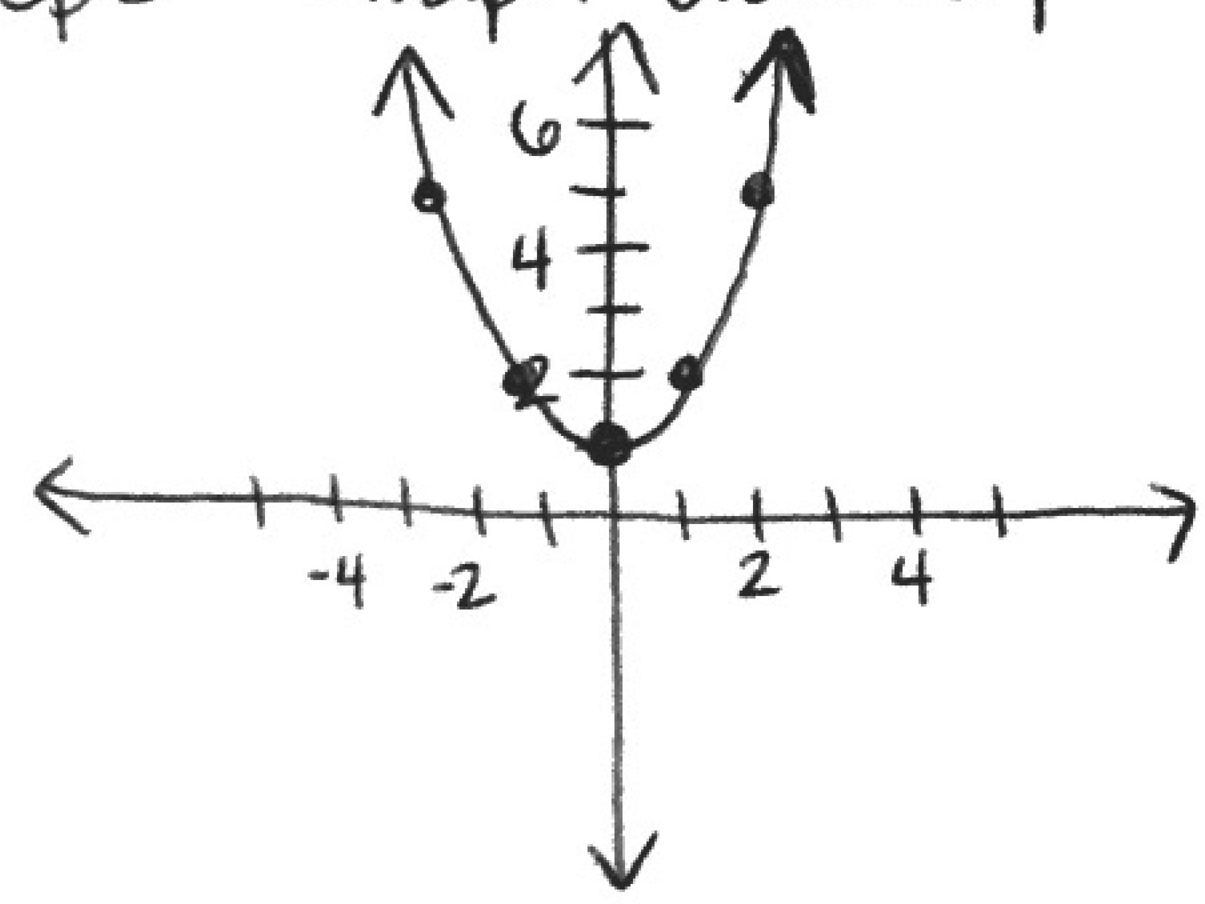


(B) $y = x^2 + 1$

Step 1: Make a table of values.

| $x$ | $y = x^2 + 1$ | $(x, y)$ |
|---|---|---|
| $-2$ | $y = (-2)^2 + 1 = 5$ | $(-2, 5)$ |
| $-1$ | $y = (-1)^2 + 1 = 2$ | $(-1, 2)$ |
| $0$ | $y = (0)^2 + 1 = 1$ | $(0, 1)$ |
| $1$ | $y = (1)^2 + 1 = 2$ | $(1, 2)$ |
| $2$ | $y = (2)^2 + 1 = 5$ | $(2, 5)$ |

Step 2: Graph ordered pairs.




* $x^2$ graphs (when raised to 2nd power) you will always have a "U" shaped graph