

Unit 6

Day 1

Review of Functions

Relation - A set of ordered pairs.

Function - A relation in which each x-value (input) corresponds to exactly one y-value (output)

Means: No repeated x values.

Vert. line test

All functions are relations but not all relations are functions.

Function - The input value x is your student ID number and the output value y is the number of pets you have.

Relation - The input value x is the letter grade on the last unit test and the output value y is the ID number of each student enrolled in the course.

Graphically - Vertical line test - A relation is a function if a vertical line does not intersect the graph in more than one point.

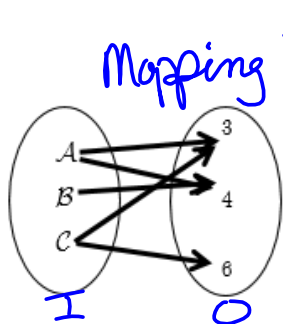
Which relation is a function? Explain why the other is not.

1. A. $\{(2, 3), (8, 3), (4, 8)\}$

B. $\{(-1, 4), (-2, 6), (3, 5), (3, 0)\}$

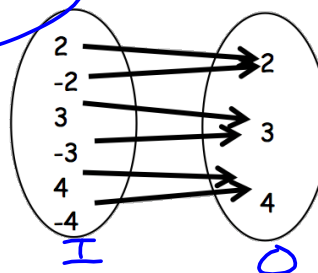
3 corresponds to 2 y-values

2. A.

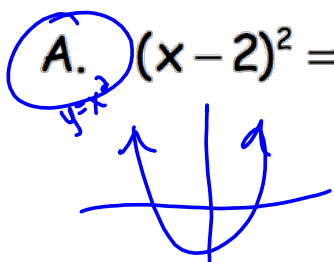


A maps to both
3 and 4

B.



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

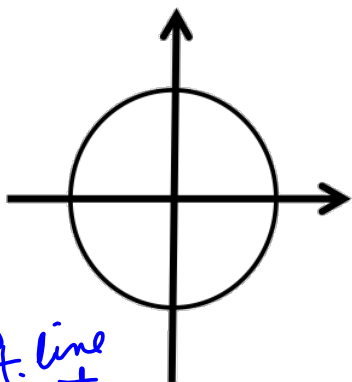


B. $(y+3)^2 = -4(x-2)$



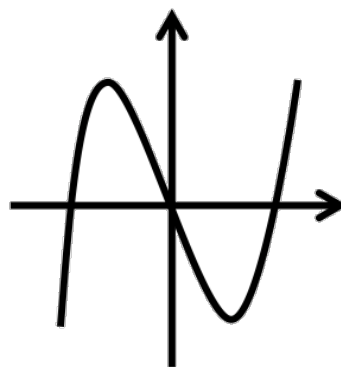
~~##~~ Fails
vert. line
test

4. A.



Fails
vert. line
test

B.



5. Given the set of points: $\{(1, 2), (3, 4), (5, 6)\}$ state another point so that the relation is no longer a function. $(3, 5)$

b/c input of $x=3$ would
have 2 diff. outputs
(y's) 4 & 5

Function Notation - $f(x)$ - read "f of x", where x is the input value (domain) and $f(x)$ is the output value (range)

"fancy y"

ie: $f(2) = 4$ would correspond to the point $(2, 4)$.

When $x = 2$, $y = 4$.

Evaluate each of the following:

1. $h(t) = |t + 2| + 3$, find $h(-3)$

$$\begin{aligned} h(-3) &= |-3 + 2| + 3 \\ &= |-1| + 3 \\ &= 1 + 3 = 4 \end{aligned}$$

$$h(-3) = 4$$

2. $g(a) = 3^{3a-2}$, find $g(1)$

$$\begin{aligned} g(1) &= 3^{3(1)-2} = 3^{3-2} = 3^1 = 3 \\ g(1) &= 3 \end{aligned}$$

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

$$f(4) = -2(4)^2 + 4 = -2(16) + 4 = -32 + 4 = -28$$

4. $g(x) = 4x - 2$, find $g(2a)$

$$g(2a) = 4(2a) - 2 = 8a - 2$$

5. $f(x) = x^2 - 2x$, find $f(n^2)$

$$f(n^2) = (n^2)^2 - 2n^2 = n^4 - 2n^2$$

6. $h(x) = \sqrt{2x - 3}$, find $h(n + 4)$

$$h(n+4) = \sqrt{2(n+4) - 3} = \sqrt{2n+8-3} = \sqrt{2n+5}$$

Side note: $\sqrt{9n^2+4} \neq 3n+2$

$$\begin{aligned} \sqrt{16+9} &\neq 4+3=7 \\ \sqrt{25} &= 5 \end{aligned}$$

7. Given the graph, $f(x)$, at right, find each of the following:

a. $f(-1) = \underline{-1}$ *what is the y when $x = -1$?*

b. $f(0) = \underline{3}$

c. $f(2) = \underline{0}$

d. $f(4) = \underline{3}$

e. $f(6) = \underline{1}$

f. $f(7) = \underline{3}$

