# Chapter 3 - Linear Equations and Functions

3.8 Objective: To find values of functions and to graph functions.

3.10 Objective: To graph relations and to determine when relations are also functions.

Agenda
1) Take out HW to be checked

Last nights HW:
p. 140 Self Test #2
2) DO NOW   *# 1-6, 10*
3) Define: Relation, Function, Function Notation
4) Example Problems- Function Notation
   - with partner
   - on board
5) Recognize Functions vs. Relations
6) Practice with Function Notation
7) Exit Ticket

HW: p 144 Oral Ex. # 7, 10
p 144 Written Ex. # 25
*p 156 Written Ex. #1, 3, 7**, 22, 23*

Chapter 3 - Linear Equations and Functions

3.8 Objective: To find values of functions and to graph functions.

3.10 Objective: To graph relations and to determine when relations are also functions.

DO NOW

Graph both on the same set of axis.
The SOLUTION is where the SHADINGS OVERLAP

$$y < 4 \qquad\qquad y \leq 2x - 4$$
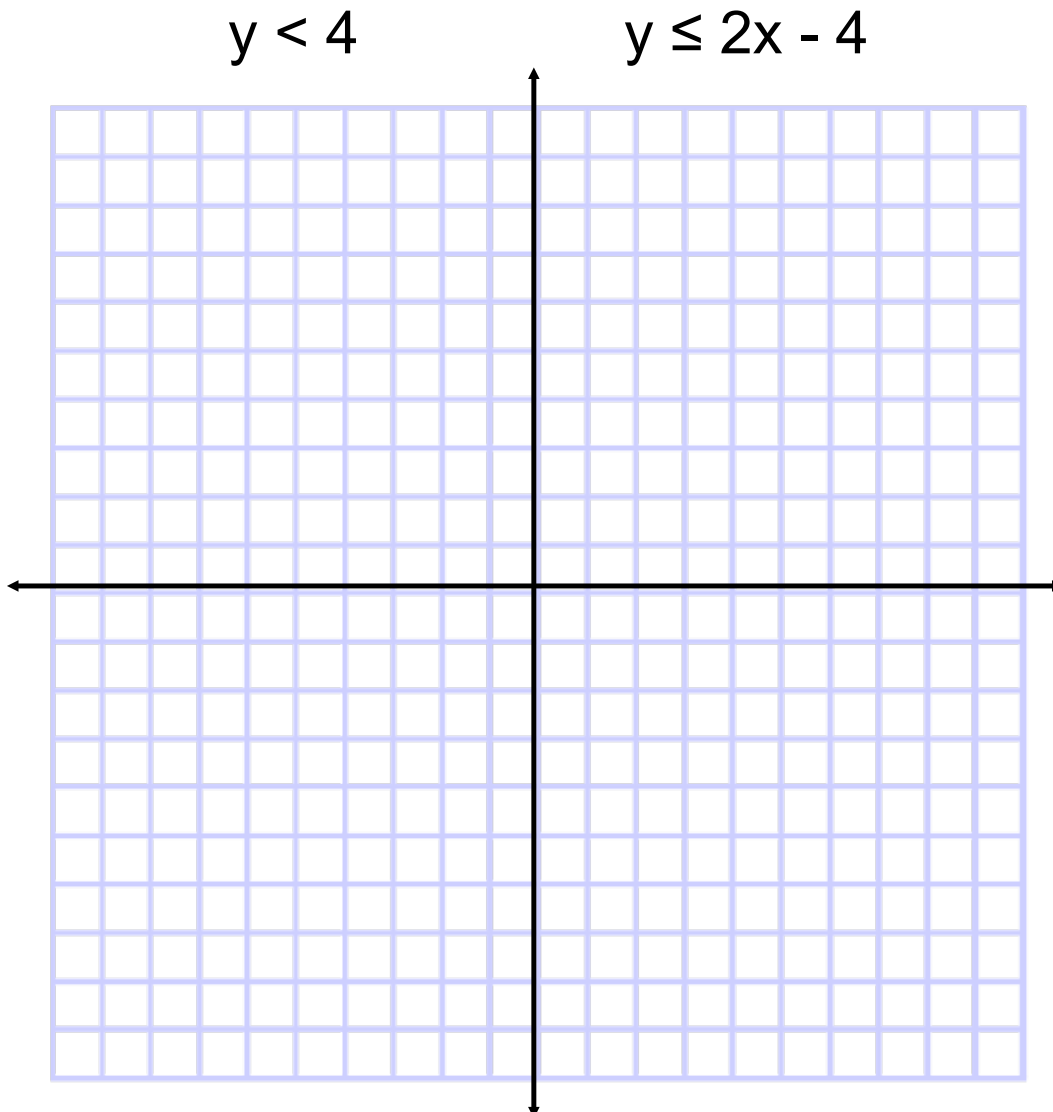
Define: Relation, Function, Function Notation

RELATIONS AND FUNCTIONS

RELATION: Any set of ordered pairs (x,y)

DOMAIN: The set of first coordinates (x) in the ordered pairs (input)
RANGE: The set of second coordinates (y) in the ordered pairs (output)

FUNCTION: A relationship that assigns each input (x) with ONLY one output (y)

DOMAIN: The set of first coordinates (x) in the ordered pairs (input)
RANGE: The set of second coordinates (y) in the ordered pairs (output)

Function Notation:

Were used to	*New Notation*	*Book's Notation*
$y = 3x + 2$	$f(x) = 3x + 2$	$f: x \rightarrow 3x + 2$
If x = 3, what is y?	Solve $f(3)$.	Solve $f(3)$.
$y = 3(3) + 2$	$f(3) = 3(3) + 2$	$f(3) = 3(3) + 2$
$y = 9 + 2$	$f(3) = 9 + 2$	$f(3) = 9 + 2$
$y = 11$	$f(3) = 11$	$f(3) = 11$

Example: $f(x) = x^2 - 1$ $g(x) = 5 - 2x$

Find:

f(3)   f(-5)

g(-5)   If g(x) = 25, find x.

Recognize Functions vs Relations

Decide if the following are functions or not. Circle F for function or R for relation.
If relation, explain why it is not a function.

*If you have **a set of ordered pairs:***

1. F R   { (3, 9), (2,4), (1,1), (0,0), (-1,1), (-2,4), (-3,9)}

2. F R   { (25, 5), (16, 4), (9,3), (25, -5)}

3. F R   { (3,3), (2,2), (1,1), (0,0), (-1,-1), (-2,2-), (-3,-3)}

*If you have **a table of values:***

4.

x	y
0	-19
1	-12
2	-4
3	3
5	27

F or R

5.

x	y
-5	8
-3	8
-1	-2
1	-2
5	23

F or R
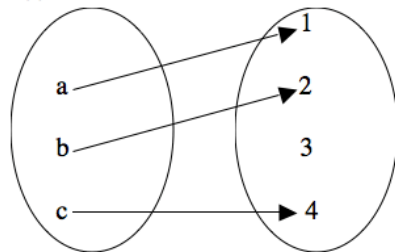
6.

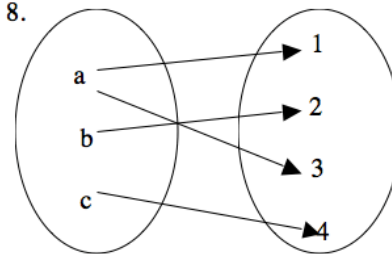| x	y
-2	-7
-2	5
0	-16
2	0
2	6

F or R

If you have a mapping diagram:
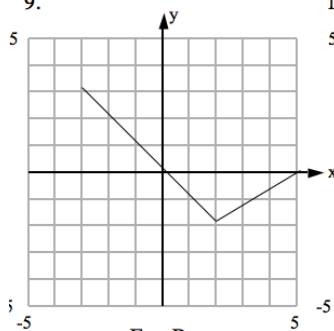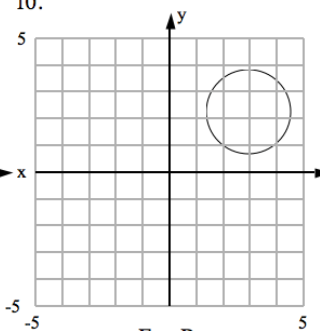
7.

F or R

8.

F or R

If you are given a graph:
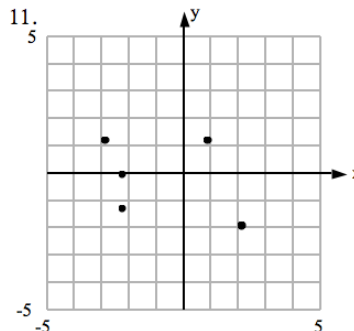Strategy for Testing Graphs: _____

9.

F or R

10.

F or R

11.

F or R

Practice with Function Notation

Find the requested values.
Remember: The notation f(3) means "What is y when x = 3?"
The notation f(x) = 3 means y = 3.

1. Given $f(x) = -3x + 2$

      a) $f(4) =$ _____   b) $f(-2) =$ _____

      c) If $f(x) = 17$, then $x =$ _____   d) $f(17) =$ _____

2. Given $g(x) = x^2 - 4$

      a) $g(-2) =$ _____   b) $g(a) =$ _____

      c) If $g(x) = 5$, then $x =$ _____ or _____ d) $g(0) =$ _____

3. $h(x) = (x-3)(x-2)$

      a) $h(3) =$ _____   b) $h(-4) =$ _____

      c) $h(0) =$ _____   d) $h(b^2) =$ _____

Two functions are *equal* if they consist of the same ordered pairs. The following functions have the same domain D and range R. Determine if the functions are equal.

4. D = {-1, 0, 1, 2, 3}   f: x ⟶ 2x + 1   g: x ⟶ 5 - 2x

5. D = {-2, -1, 0, 1, 2}   f: x ⟶ |x| + 2x   g: x ⟶ |x| - 2x

_____ out of 7

Name _____

Block _____

Exit Ticket

Given: $f(x) = 3x - 4$ $g(x) = x^2 + 3$

Find
1. f(0)   2. g(-3)   3. f(x)= 8, solve for x

4. Is the following relation a function?

{ (-3, 2) (-2,2) (-1,2) (0,2) (1,2) }   Yes or No   (circle one)