DO NOW

Use the given information to write a function in the form $f(x) = mx + b$:

$m = -2$ and $f(-2) = 8$

$y - y_1 = m(x - x_1)$

$y - 8 = -2(x - -2)$

$y - 8 = -2x - 4$

$y = -2x - 4 + 8$

$y = -2x + 4$

$f(x) = -2x + 4$

3.5 Functions - (continued)

function notation - $f(x)$ ← "f of x"

$g(x)$ ← "g of x"

★ Allows the use of multiple equations

function - pairs each element of the DOMAIN with one and only one element of the RANGE

★ No two ordered pairs have the same x-value

When listing domain and range:

- put numbers in order
- do not repeat numbers

Find the domain and range of each relation. Also determine whether the relation is a function.

Ex: 1. {(1, 4), (2, 5), (3, 6), (4, 7)}

domain: {1, 2, 3, 4}

range: {4, 5, 6, 7}

function ★ no repetition of x-values

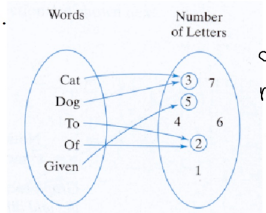
2. {(3, 1), (5, 4), (3, 6), (8, 9)}

domain: {3, 5, 8}

range: {1, 4, 6, 9}

not a function ★ There are 2 x-values of 3

3.



domain: {cat, dog, to, of, given}

range: {2, 3, 5}

function

Vertical Line Test - If no vertical line can be drawn that intersects the graph more than once (at the same instant), then the graph is a function.

4. Which of the following graphs are of functions?

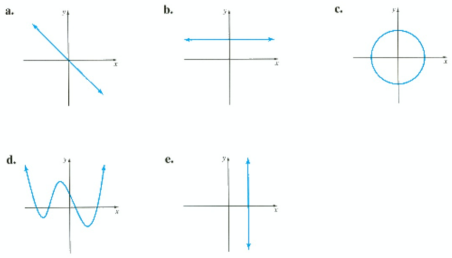
a. function

b. function

c. not a function

d. function

e. not a function



3.6 The Algebra of Functions

Operations on functions:

It is possible to perform the four basic operations $(+, -, \times, \div)$ on functions

Sum: $f + g = f(x) + g(x)$

difference: $f - g = f(x) - g(x)$

product: $f \cdot g = f(x) \cdot g(x)$

quotient: $\frac{f}{g} = \frac{f(x)}{g(x)}$

5. If $f(x) = 4x + 1$ and $g(x) = 3x$ for each of the following, find the function $h(x)$ and state any restrictions to the domain.

a. $f + g$ $h(x) = f(x) + g(x)$

$h(x) = 4x + 1 + 3x$

$h(x) = 7x + 1$

b. $f - g$ $h(x) = f(x) - g(x)$

$h(x) = 4x + 1 - 3x$

$h(x) = x + 1$

c. $f \times g$ $h(x) = f(x) \cdot g(x)$

$h(x) = 3x(4x + 1)$

$h(x) = 12x^2 + 3x$

d. $\frac{f}{g}$ $h(x) = \frac{f(x)}{g(x)}$

$h(x) = \frac{4x + 1}{3x}$

HOMEWORK

Worksheet - HW 3.6 Functions