Algebra 2 2.1

Analyze relations and functions

Use equations of relations and functions

relation

function

one-to-one function

onto (not one-to-one) function disregard :(

domain

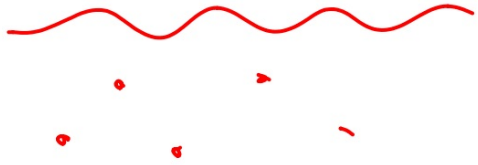
range

continuous

discrete

vertical line test (VLT)

cut & paste activity

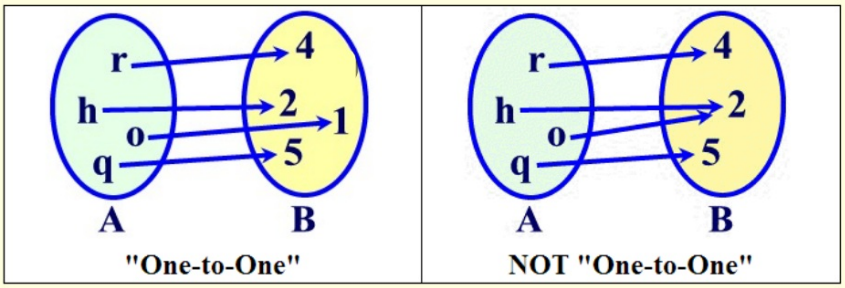


independent variable

dependent variable

function notation

In a one-to-one function, given any y there is only one x that can be paired with the given y.
Such functions are referred to as injective.

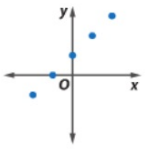


function? function?

Function: Does every x have a single partner?
One to one function: Does every x have a single partner?
AND Nobody shares a y partner either?

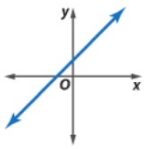
A relation in which the domain is a set of individual points, like the relation in Graph A, is said to be a **discrete relation**. Notice that its graph consists of points that are not connected. When the domain of a relation has an infinite number of elements and the relation can be graphed with a line or smooth curve, the relation is a **continuous relation**.

Graph A



discrete relation

Graph B



continuous relation

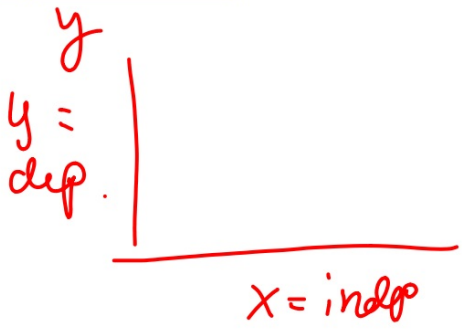
Number of pets

Weight of a pet

spag | nick.

spaghetti & nickles

When an equation represents a function, the variable, often x, with values making up the domain is called the **independent variable**. The other variable, often y, is called the **dependent variable** because its values depend on x.



Function notation (algebra 1) every place you see an x, substitute
cut & paste

Example 4 Evaluate a Function

Given $f(x) = 2x^2 - 8$, find each value.

a. $f(6)$

$f(x) = 2x^2 - 8$

$f(6) = 2 \cdot 6^2 - 8$

$= 2 \cdot 36 - 8$

$= 72 - 8$

$= 64$

b. $f(2y)$

$f(x) = 2x^2 - 8$

$f(2y) = 2 \cdot 2y \cdot 2y - 8$

$= 8y^2 - 8$

GuidedPractice

Given $g(x) = 0.5x^2 - 5x + 3.5$, find each value.

4A. $g(2.8)$

4B. $g(4a)$

$g(2.8) = 0.5 \cdot 2.8 \cdot 2.8 - 5 \cdot 2.8 + 3.5$

$= 3.92 - 14 + 3.5$

$= -6.58$

$g(4a) = 0.5 \cdot 4a \cdot 4a - 5 \cdot 4a + 3.5$

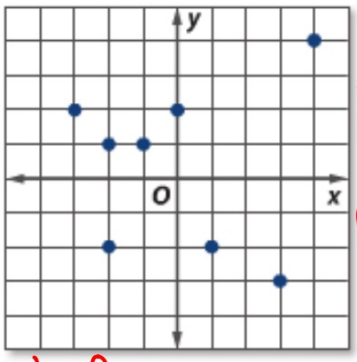
$= 8a^2 - 20a + 3.5$

whiteboards

mapping

State the domain and range of each relation. Then determine whether each relation is a *function*. If it is a function, determine if it is *one-to-one*, ~~*onto*~~, *both*, or *neither*.

1A.

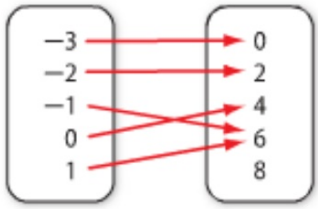


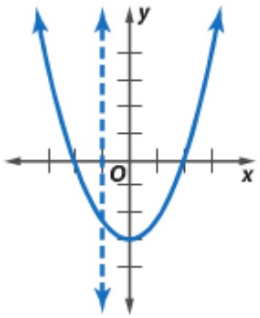
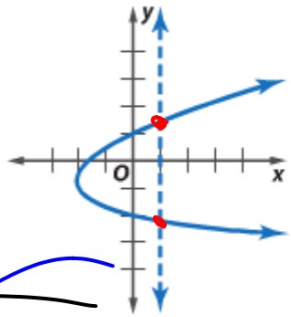
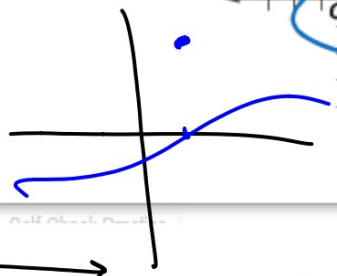
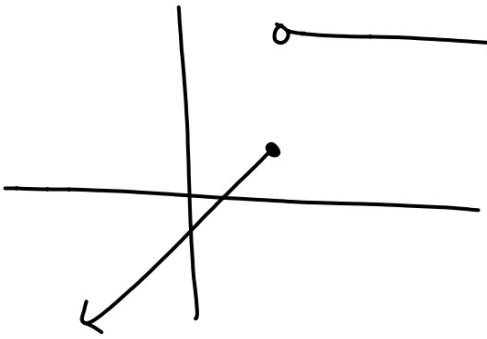
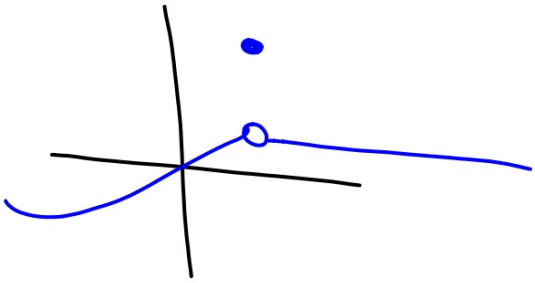
D = -3, -2, -1, 0, 1, 3, 4

R = 4, 2, 1, -2, -3

not func.

1B.



KeyConcept Vertical Line Test

Words	If no vertical line intersects a graph in more than one point, the graph represents a function.	If a vertical line intersects a graph in two or more points, the graph does not represent a function.
Models