Algebra 1   1.6
Represent relations
Interpret graphs of relations
coordinate system
ordered pair
x-coordinate (x, y)
y-coordinate

relation (x, y) $(2, 5)$
mapping
domain $\times$
range y
independent variable
dependent variable

$D = -1, -2, 1, 2, 3, \cancel{4}$

$R = 4, 0, 3, 1, -2, 5$

$(-1, 4)$

$(2, 5)$

$(2, 3)$

$(-2, 0)$

$(1, 1)$

$(3, -2)$

(x, y)

x

y

O

Domain
X

Range
y

mapping

-2
-1
0
1
2

4
6
8

$(-2, 4)$
$(-1, 4)$
$(0, 6)$
$(1, 8)$
$(2, 8)$

Relation

$D = -2, -1, 0, 1, 2$
$R = 4, 6, 8$

Ordered Pairs

(1, 2)
(−2, 4)
(0, −3)

Table

X	y
1	2
−2	4
0	−3

Graph

(−2, 4)

(1, 2)

O

(0, −3)

Mapping

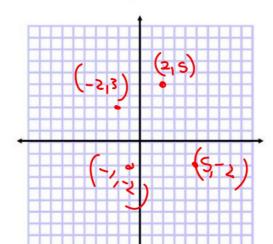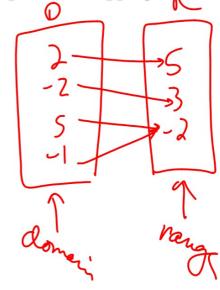| Domain	Range
1	2
−2	4
0	−3

1
−2
0

−3
2
4

Example 1 Representations of a Relation

a. Express $\{(2, 5), (-2, 3), (5, -2), (-1, -2)\}$ as a table, a graph, and a mapping.
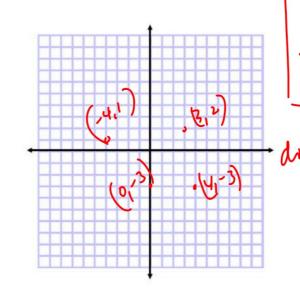
x	y
2	5
-2	3
5	-2
-1	-2

D

R

2 → 5
-2 → 3
5 → -2
-1 →

domain   range

(2, 5)

(-2, 3)

(-1, -2)

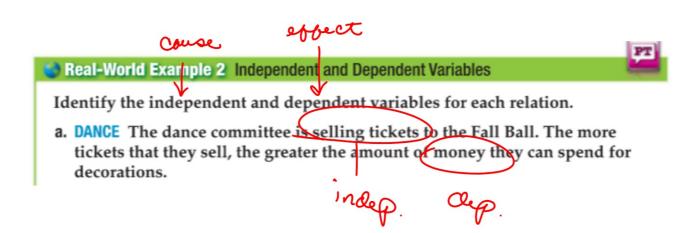(5, -2)

b. Determine the do

D: 2, -2, 5, -1

R: 5 +3, -2

1A. Express {(4, −3), (3, 2), (−4, 1), (0, −3)} as a table, graph, and mapping.

1B. Determine the domain and range.

D   R

4	−3
3	2
−4	1
0	−3

D: 4, 3, −4, 0
R: −3, 2, 1

4 → 3
3
−4 → 2
0 → 1
9

↑ domain   range

(−4, 1)   (3, 2)

(0, −3)   (4, −3)

cause

effect

🌐 Real-World Example 2 Independent and Dependent Variables

Identify the independent and dependent variables for each relation.

a. **DANCE** The dance committee is selling tickets to the Fall Ball. The more tickets that they sell, the greater the amount of money they can spend for decorations.

indep.   *dep.*

Which thing causes the other thing?

b. MOVIES Generally, the average price of going to the movies has steadily increased over time.

X , y

(indep dep)

Price

Year

Identify the independent and dependent variables for each relation.

2A. The air pressure inside a tire increases with the temperature.

2B. As the amount of rain decreases, so does the water level of the river.

Cause - indep.   T   rain

happens-dep   P   river

Example 3 Analyze Graphs

The graph represents the distance Francesca has ridden on her bike. Describe what happens in the graph.

Bike Ride

Describe what is happening in each graph.

3A. **Driving to School**

3B. **Change in Income**