

## MS Algebra: 2.1.1 - Day 1

### Warm-up

Goal: I understand function notation and that a function is a relationship between an independent and dependent variable.

HW: Worksheet 2.1.1

### Warm - Up

$$\begin{array}{r} -7 \quad \frac{2}{5} \\ 3.72 \end{array}$$

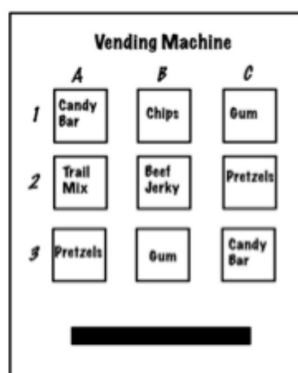
**Rational**

or

*never repeats  
never stops* → **Irrational**

$$\pi$$
$$\sqrt{12} \quad 4.2471\dots$$

Functions are used to model many real world situations. In this section, we will define a function and learn to distinguish between functions and other relations.



Pictured above is a vending machine in the school lobby. Assuming you inserted the correct amount of money for each purchase, tell whether you think the vending machine is:

- Functioning (working properly)
- Not Functioning (broken)

#### Situation A

- 1) You press A1 and a candy bar comes out. *Functioning*
- 2) You press C3 and a candy bar comes out. *Functioning*
- 3) You press B1 and chips come out. *Functioning*
- 4) You press B2 and beef jerky come out. *Functioning*
- 5) You press C2 and pretzels come out. *Functioning*
- 6) You press C2 again and pretzels come out. *Functioning*

#### Situation B

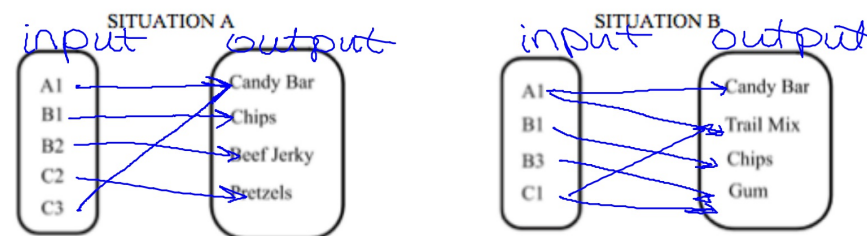
- 1) You press A1 and a candy bar comes out. *Not Functioning*
- 2) You press A1 and trail mix comes out. *Functioning*
- 3) You press B3 and gum comes out. *Functioning*
- 4) You press B1 and chips come out. *Functioning*
- 5) You press C1 and gum as well as trail mix comes out. *Not Functioning*

Answer the following questions about your observations for Situation A and Situation B:

A. In which situation, A or B, does the machine appear to be *functioning* correctly? Why?

Situation A -  
For each button pushed,  
you get 1 correct snack item

B. Construct a mapping chart for each vending machine situation by drawing arrows from the input (button pushed) to the output (snack received).



C. For situation A, how many outputs does each input have? one

D. For situation B, how many outputs does in input have? one or two

E. Situation A represents a function. Situation B is NOT a function.

Definition of a Function: A relationship between two variables (input and output) where each input has only one output.

F. Choose the statement below that makes the most sense when using a vending machine:

1) The button you push depends on the snack you receive.

2) The snack you receive depends on the button you push

1<sup>st</sup>: Push button  
2<sup>nd</sup>: Get snack

G. Based on your answer to letter F, identify the independent and dependent variables for the vending machine function.

independent variable: button pushed

dependent variable: snack you receive

## Independent/Dependent

**You buy as many candy bars you can with your \$5.**

1<sup>st</sup>: <sup>independent</sup> # of Candy bars  
2<sup>nd</sup>: <sup>dependent</sup> total cost  
Cost depends on # of candy bars

**When the temperature gets below 32° I wear my winter coat.**

1<sup>st</sup>: <sup>independent</sup> temperature  
2<sup>nd</sup>: <sup>dependent</sup> wear coat  
Wearing coat depends on temp

## Start of Homework

Write whether the given variable is independent or dependent.

1) <sup>1<sup>st</sup> - indep</sup> The size of a fire <sup>2<sup>nd</sup> - dependent</sup> effects the number of firefighters needed to fight the fire.

Ask yourself- does the size of the fire depend on the number of firefighters needed OR does the number of firefighters needed depend on the size of the fire?

- number of fire fighters needed: dependent
- size of the fire: independent

2) <sup>2<sup>nd</sup></sup> Auto insurance costs increase with each <sup>1<sup>st</sup></sup> accident and traffic tickets.

Ask yourself- does your number of accident and traffic tickets depend on how much you pay for auto insurance OR does how much you pay for auto insurance depend on your number of accident and traffic tickets?

- number of accidents/violations: independent
- cost of auto insurance: dependent

3) <sup>2<sup>nd</sup></sup> Your school is raising money by <sup>1<sup>st</sup></sup> selling Happenings books.

Ask yourself- does the amount of money your school raises depend on the number of books sold OR does the number of books sold depend on the amount of money your school raises?

- Amount of money raised: dependent
- Number of Happenings books sold: independent

4) Christian is <sup>1<sup>st</sup></sup> buying several DVD's that cost <sup>total → 2<sup>nd</sup></sup> \$12 each.  
Ask yourself- does how much you pay depend on the number of DVDs you buy OR does the number of DVDs you buy depend on how much you pay?

- total cost of the DVD's: dependent
- number of DVD's purchased: independent

5) Each year, the nurse or doctor checks your height.

Ask yourself- does your age depend on your height OR does your height depend on your age?

- Your age: \_\_\_\_\_
- Your height: \_\_\_\_\_