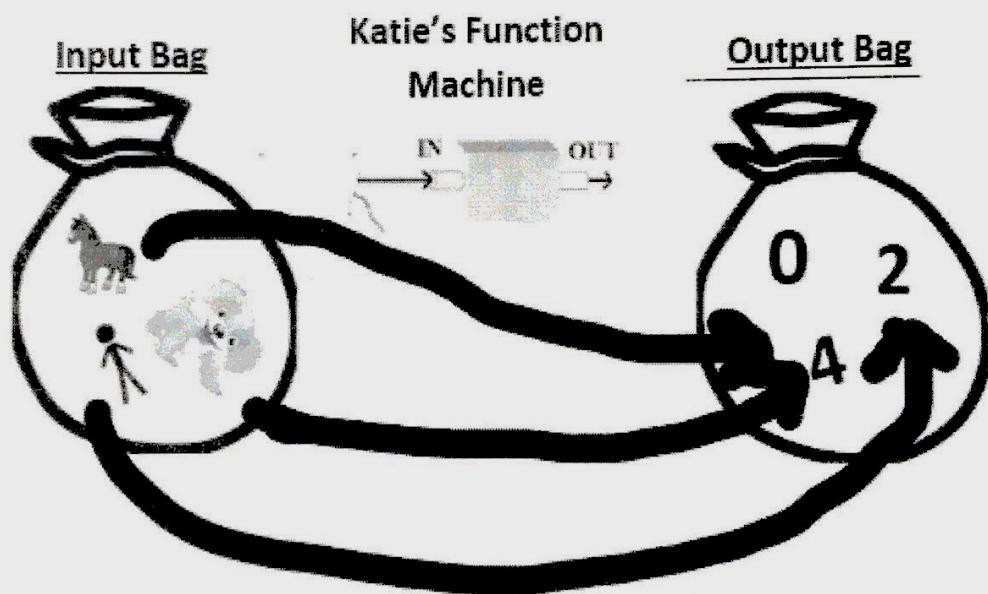


Function Machine

Part II

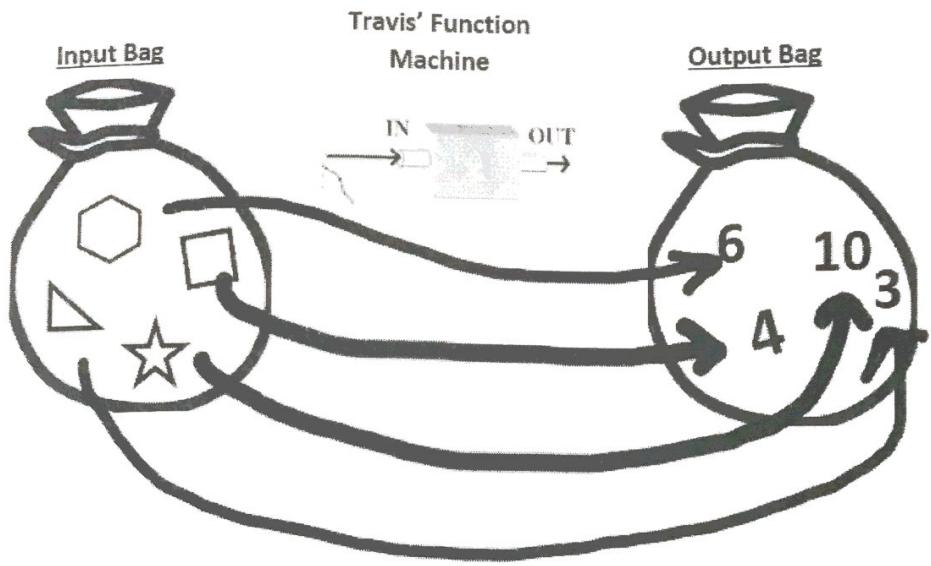
November 12th, 2017

A function is called one-to-one if every one of its inputs goes to a different output. Let's determine which of our functions from last week are one-to-one.



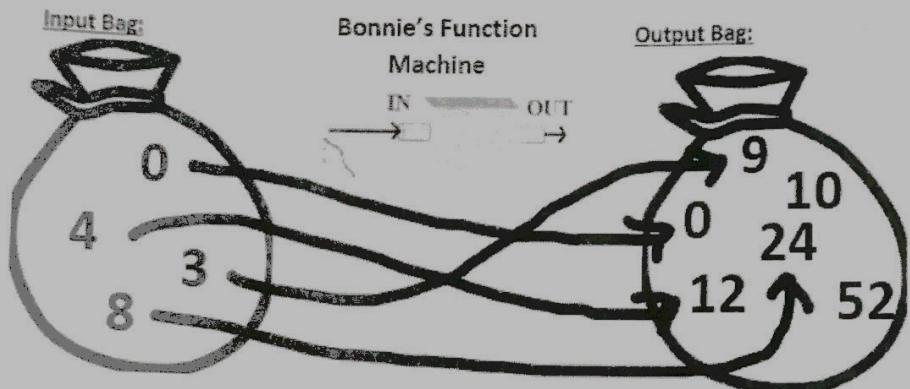
1. Is Katie's function machine one-to-one? If not, give an example of two inputs that go to the same output.

Katie's function machine is not one-to-one as there are multiple inputs that lead to the same output, such as cats and dogs



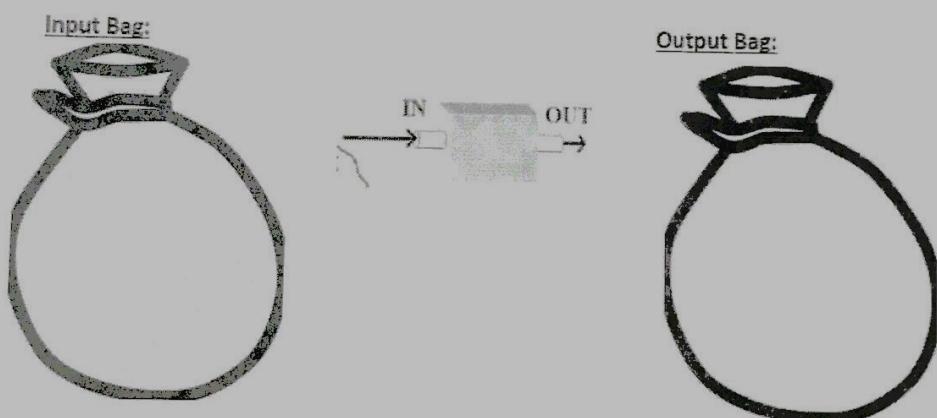
2. Is Travis' function machine one-to-one? If not, give an example of two inputs that go to the same output.

Travis' function machine is not one-to-one as both a square and a rectangle have the same number of sides/corners.

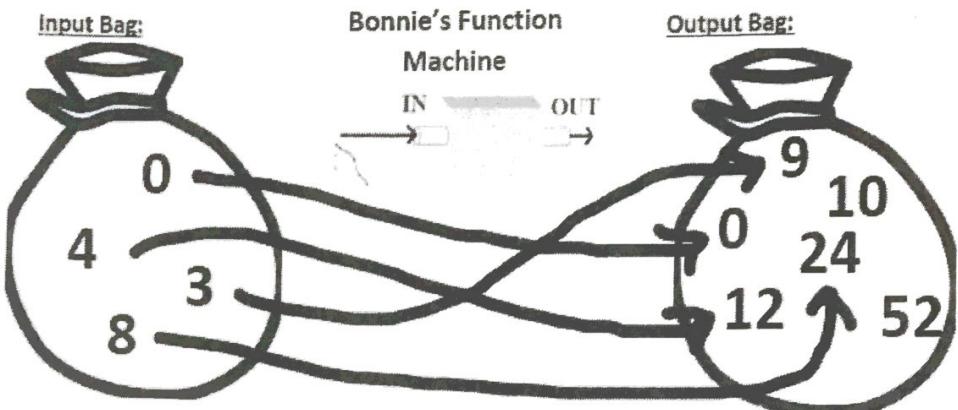


3. Is Bonnie's function machine one-to-one? If not, give an example of two inputs that go to the same output.

Bonnie's function machine is one-to-one

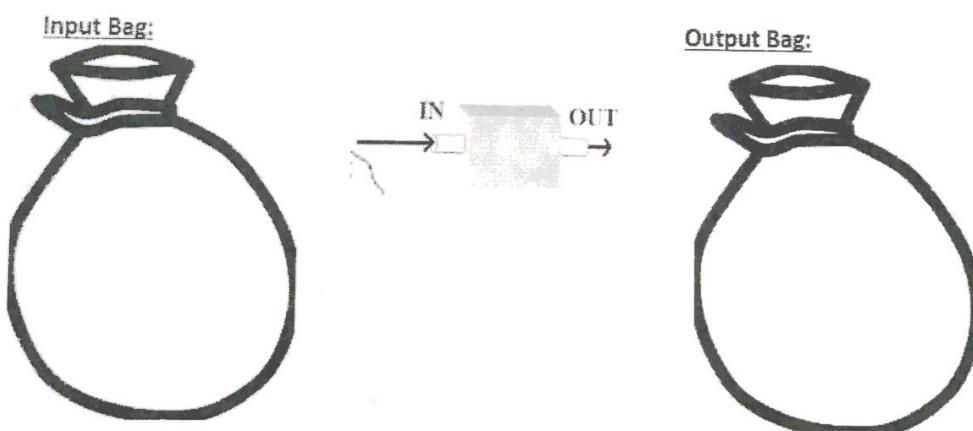


4. Is the function machine you made for homework one-to-one? If not, give an example of two inputs from your function machine that go to the same output. (You can use the above picture to fill in what your function machine looks like)



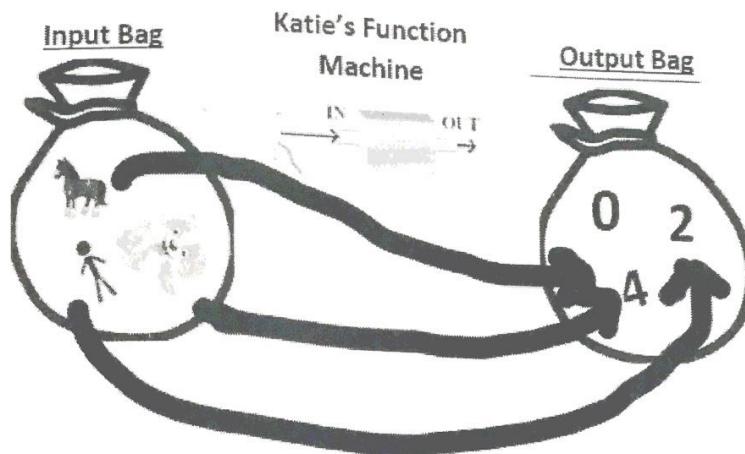
3. Is Bonnie's function machine one-to-one? If not, give an example of two inputs that go to the same output.

Bonnie's function machine is one-to-one



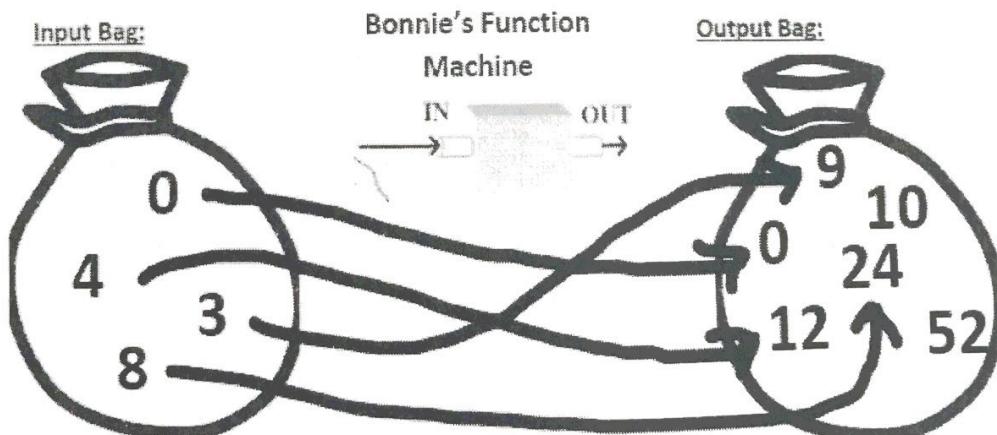
4. Is the function machine you made for homework one-to-one? If not, give an example of two inputs from your function machine that go to the same output. (You can use the above picture to fill in what your function machine looks like)

Function machines work one after the other. This can happen when one function's outputs can be another function's inputs. Let's see when this can happen.



5. What types of things are the outputs for Katie's machine?

Numbers



6. What types of things are the inputs for Bonnie's machine?

Numbers

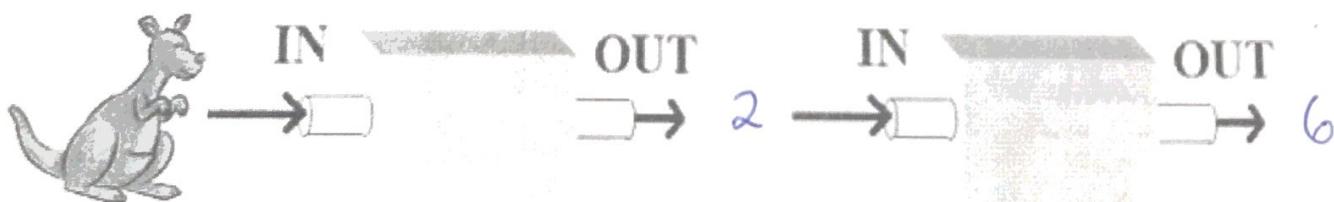
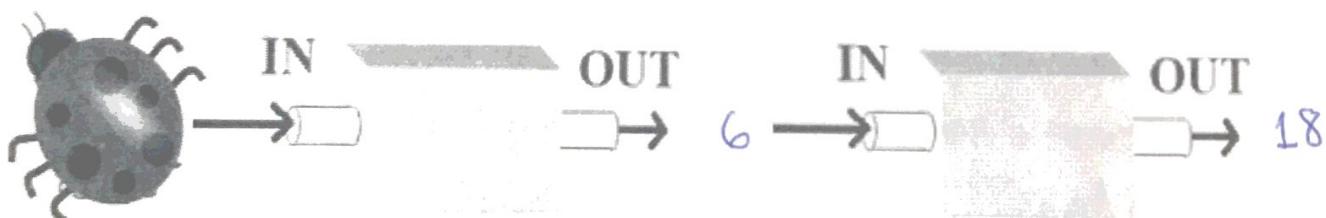
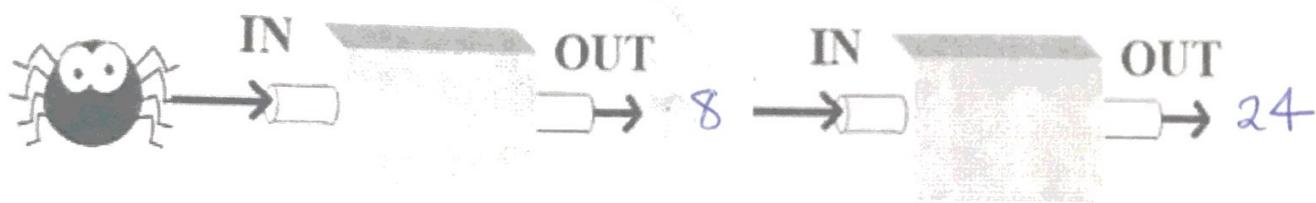
7. Can the outputs of Katie's machine go in Bonnie's machine?

Yes

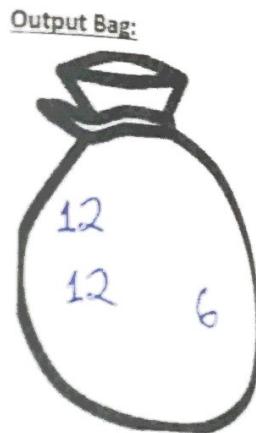
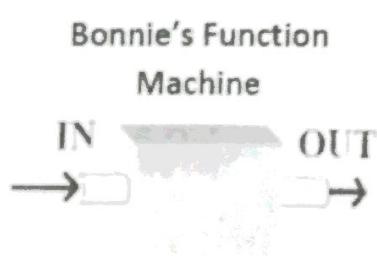
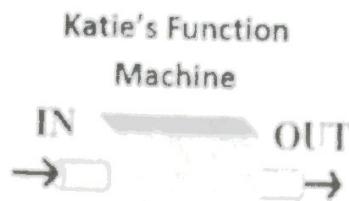
Since the outputs of Katie's machine can go into Bonnie's machine, Bonnie's machine can work after Katie's machine! Here is what that will look like:



8. What will be the outputs for the following inputs when Bonnie's machine works after Bonnie's?



9. Fill in some examples of what we will find in our Input and Output bags:



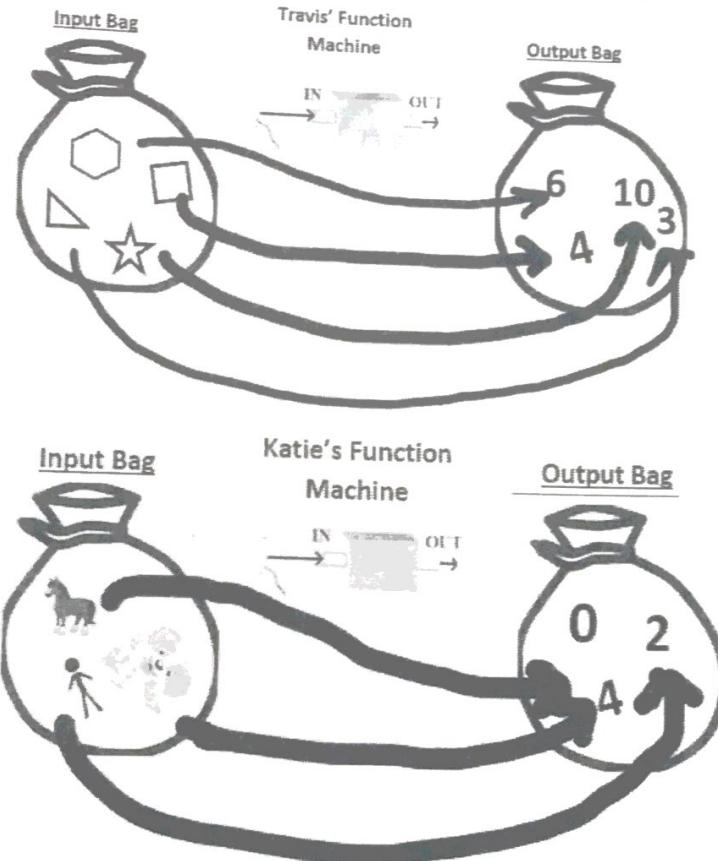
10. What types of things will we find in our Input bag?

Animals

11. What types of things will we find in our Output bag?

Numbers

If one machine's outputs can't be found in another machine's Input bag, then the machines will not work one after the other.

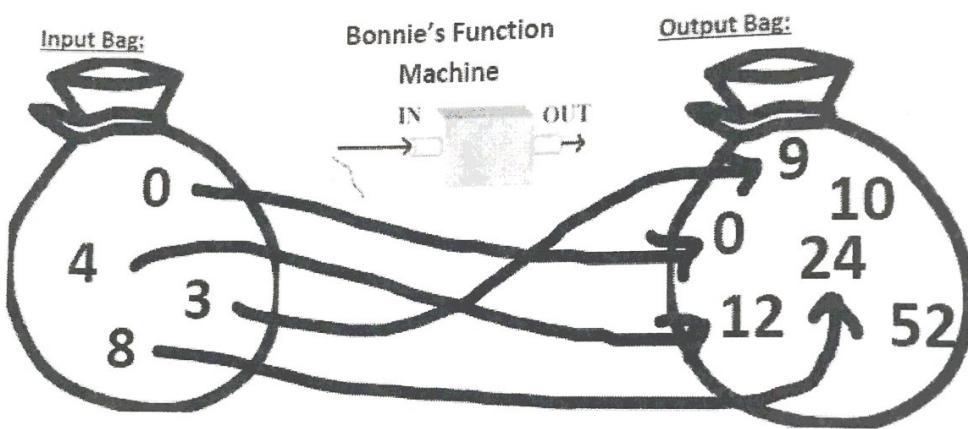
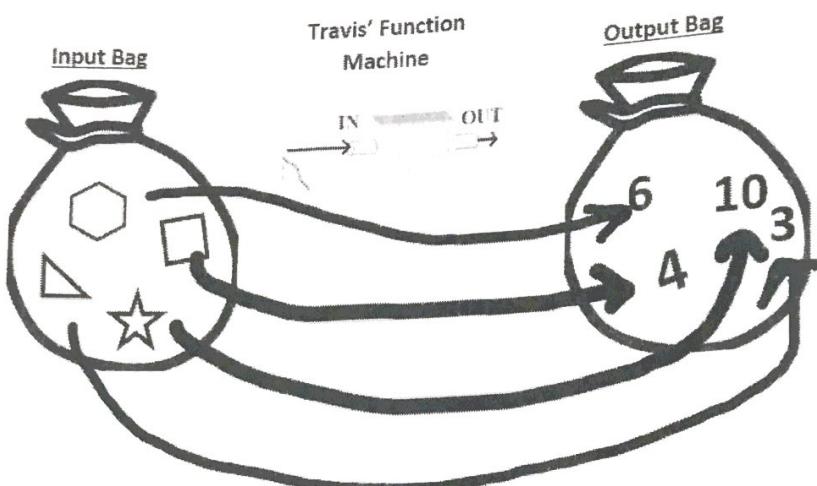


12. Above are Travis' function machine and Katie's function machine. Can Katie's machine work after Travis'? Why or why not?

No because Katie's machine needs animals as inputs and Travis' machine will give her numbers

13. Can Travis' machine work after Katie's machine? Why or why not?

No because Travis' machine needs shapes as inputs and Katie's machine will give him numbers.



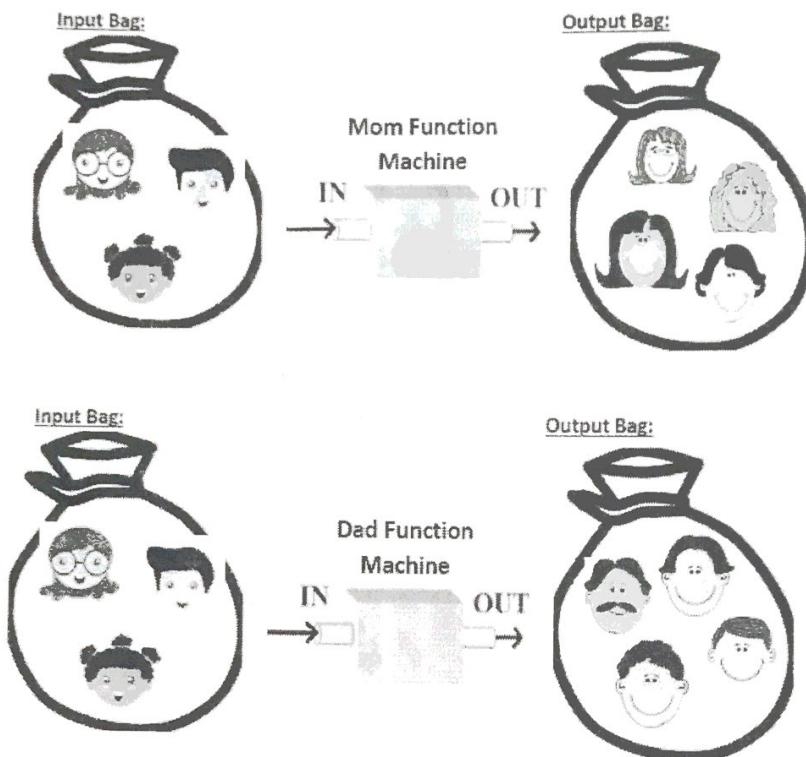
14. Above are Bonnie's function machine and Travis' function machine. Can Bonnie's machine work after Travis'? Why or why not?

Bonnie's machine can work after Travis' because her machine takes numbers as inputs and his machine gives numbers as outputs.

15. Can Travis' machine work after Bonnie's machine? Why or why not?

No because Travis' machine needs shapes as inputs but Bonnie's machine will give him numbers.

Challenge Functions:



Above are two new function machines. The first one sends any person from its Input bag to that person's mom. The second one sends any person from it's Input bag to that person's dad.

1. Is the “mom” function machine a one-to-one function? If not, give an example of when two inputs would go to the same output.

No because any siblings will be sent to the same mom.

2. Is the “dad” function machine to one-to-one function? If not, give an example of when two inputs would go to the same output.

No because any siblings will be sent to the same dad.

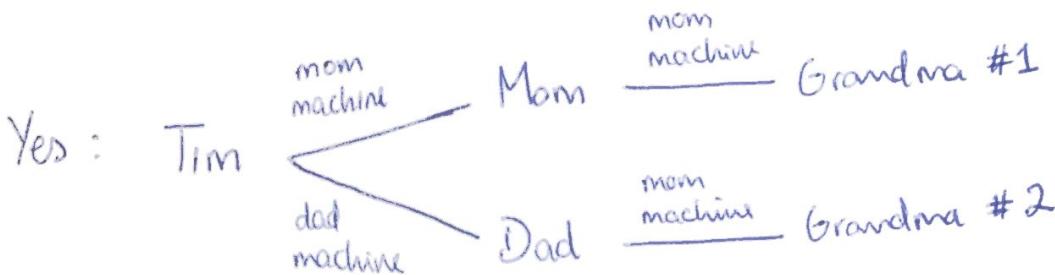
3. Can the “mom” function machine work after the “dad” function machine? Why or why not?

Yes because every dad has a mom.

4. Can the “dad” function machine work after the “mom” function machine? Why or why not?

Yes because every mom has a dad

5. Tim is a young boy, can we get to Tim's grandmother by using the function machines? Explain. (Hint: you can use a function machine more than once)



- b. Can we get to Tim's cousin by using the function machines? Explain.

No because we can only go from child to parent and not from parent to child.

- c. Can we get to Tim's uncle by using the function machines? Explain.

No because we can only go from child to parent and not from parent to child.

- d. Can we get to Tim's great-great-grandfather by using the function machines? Explain.

Yes (see other page)

GM = Grandma , GGM = Great Grandma , ~~GGG~~ GGGM = Great Great Grandma
GP = Grandpa , GGP = Great Grandpa , GGGP = Great Great Grandpa

