

2-Step Function Machines

Aim: To be able to find outputs, inputs and functions
for 2-step function machines

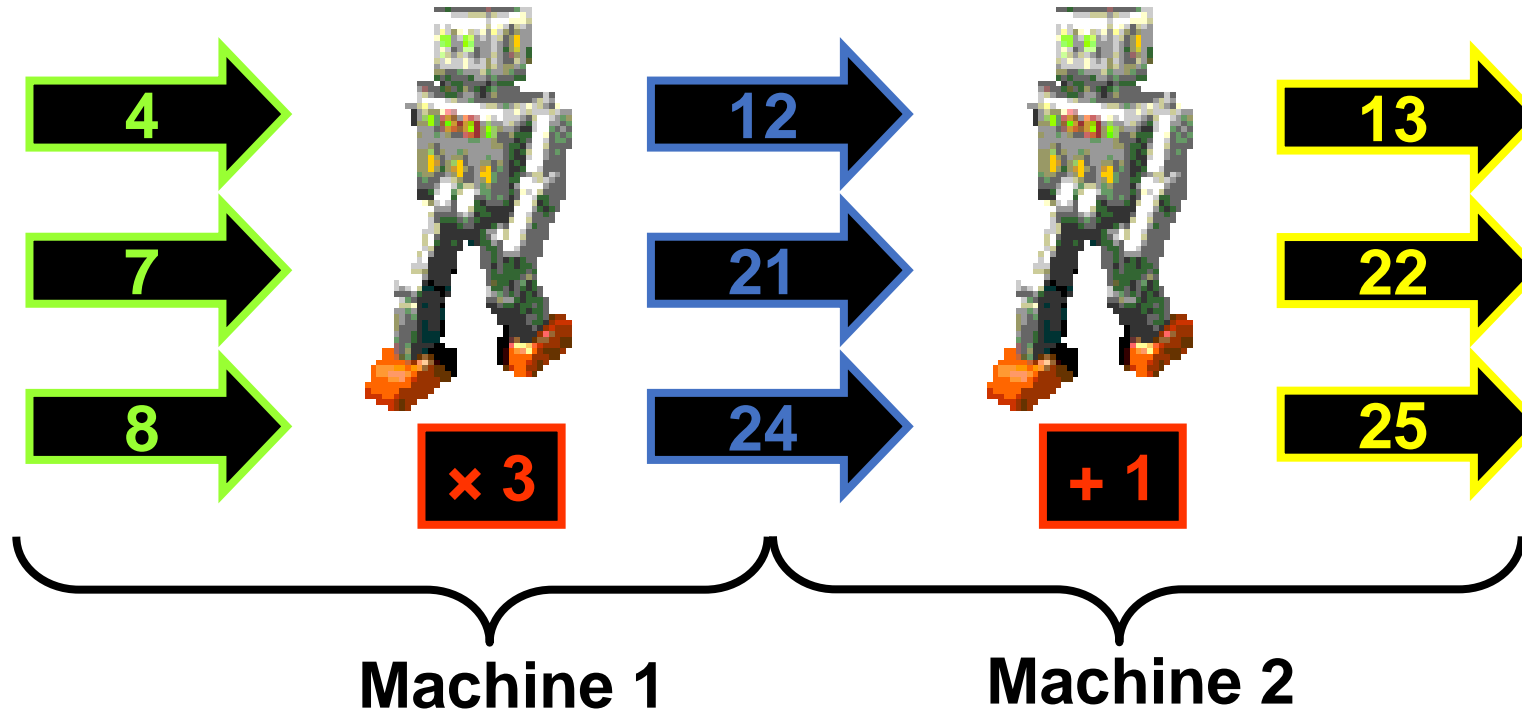
Starter:

- 1) In a function machine what are the inputs?
- 2) What are the outputs?
- 3) Show an example of a one-step function machine that only uses even numbers (for both inputs and outputs)
- 4) Show an example of a one-step function machine that only uses odd numbers.



Double vision

- Imagine that we have two robots to help us make patterns

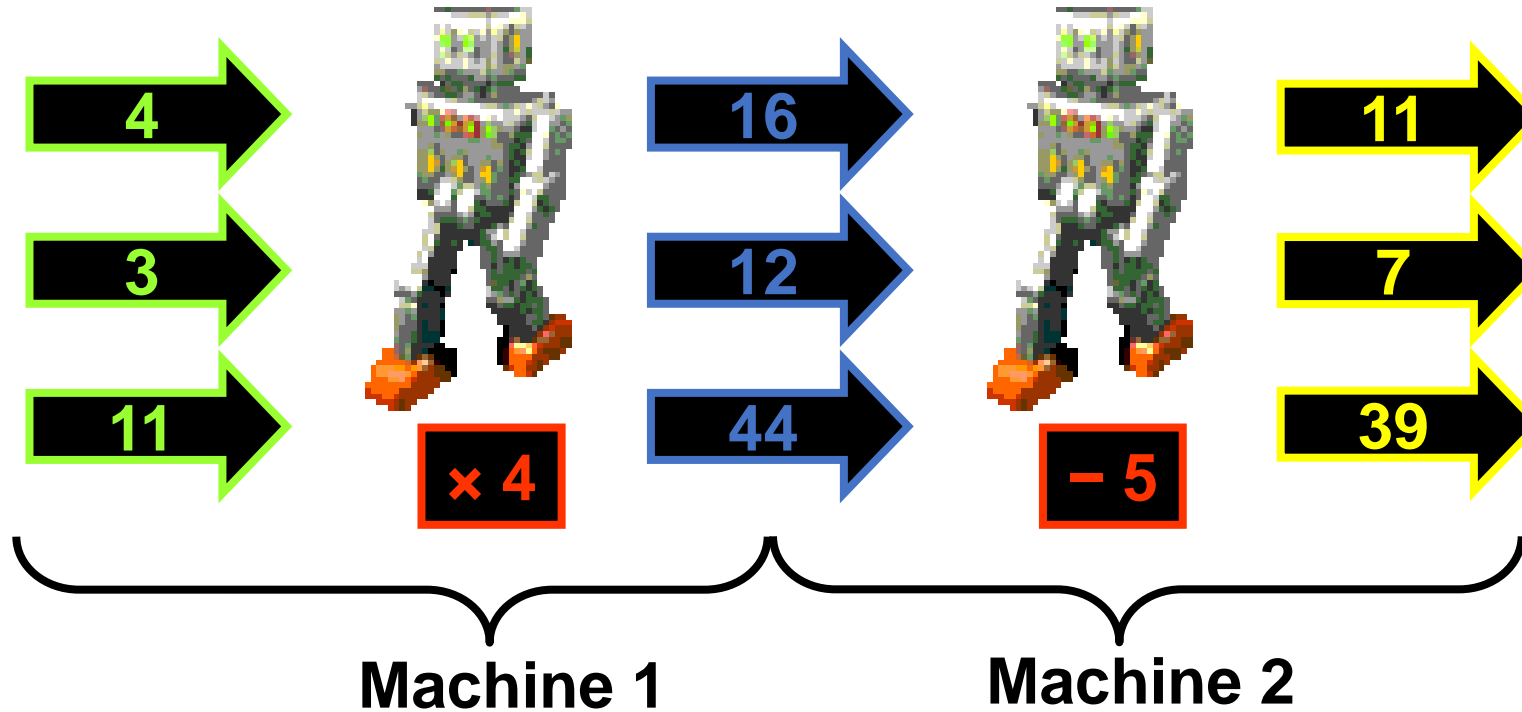


- The output of machine 1 is input to machine 2



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Two-Step Function Machines

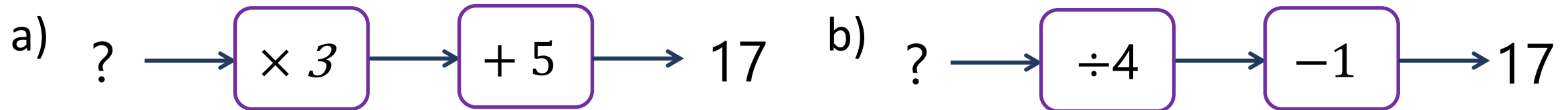
- A two step function machine is where a function is applied and then another function is applied to the answer.
- **Examples:** Find the output in each case:



Finding the Input

- When you find the input for a two-step machine you complete inverse operations in reverse order.

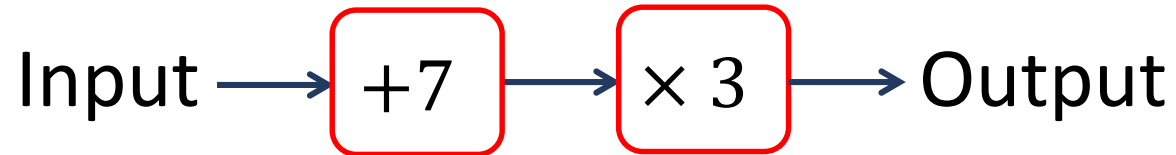
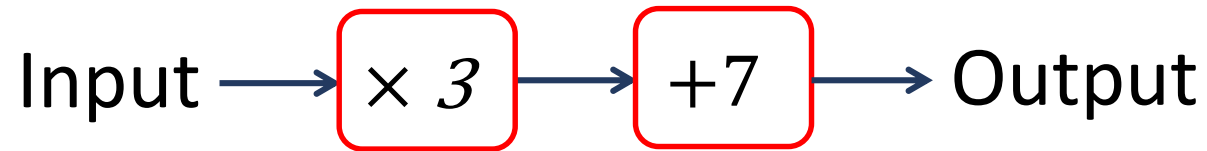
- Examples: Find the input in each case



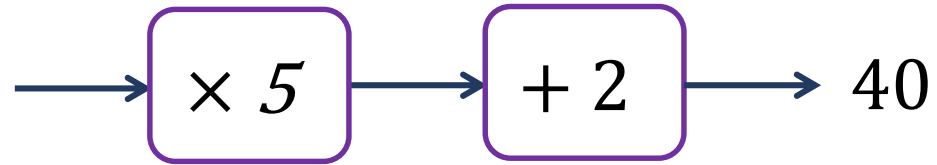
Why do you do the inverse operations in reverse order when finding the input to a pair of function machines?



Aisha says these pairs of function machines will have the same output as they are the same functions.



Give an example to show that Aisha is wrong.



Lyra says the input for this function machine is 6 as:
 $40 \div 5 = 8$ and $8 - 2 = 6$

Lyra is incorrect!

Explain why and describe the error she has made

2-Step Function Machines - Questions

1) Find the output



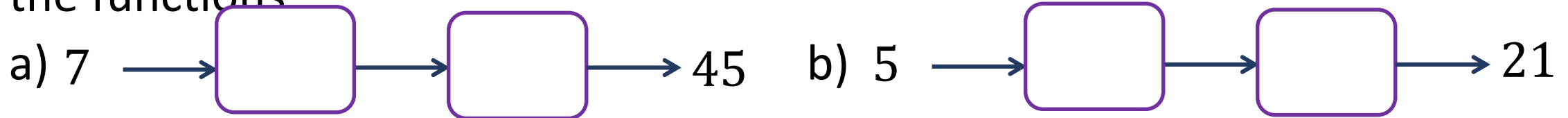
2) Create four different 2-step function machines where the input is 2 and the output is 9.

3) I think of a number subtract 2 and then multiply by 11. The result is 55.

a) Show this as a function machine.

b) Use inverse operations to work out my number.

4) Both machines have the same missing functions (in the same order). Find the functions



Design some problems of your own like question 4