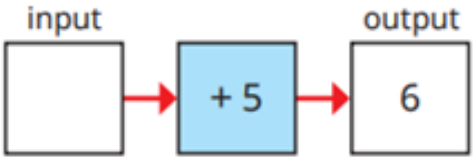
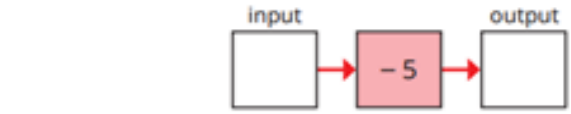
Monday 20.2.23

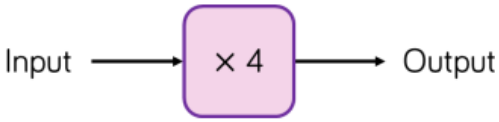
MPI: Using one-step functions





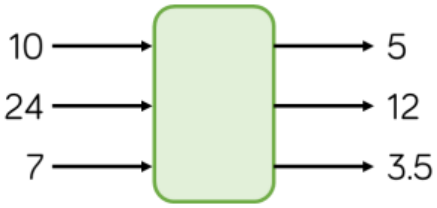
Input	5	23	5.1	23.2	0	–3	–5
Output							

Here is a function machine.

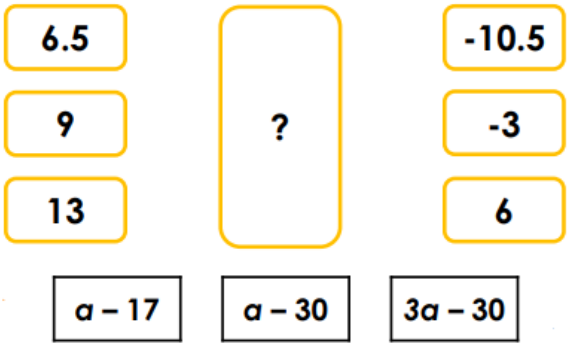


- What is the output if the input is 2?
- What is the output if the input is 7.2?
- What is the input if the output was 20?
- What is the input if the output was 22?

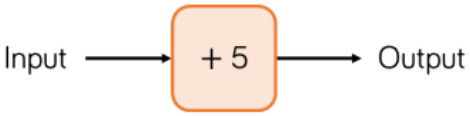
Find the missing function.



Circle the function being used here.

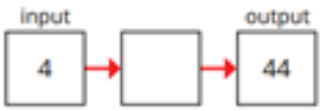


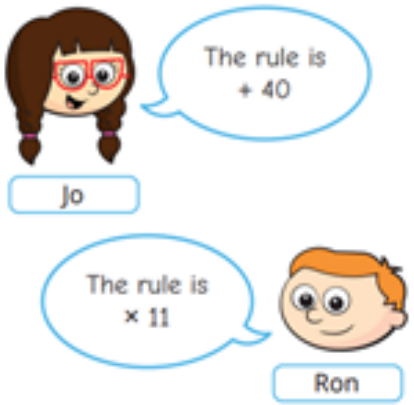
Complete the table for the function machine.



Input	5	5.8	10	– 3	– 8			
Output						9	169	0

Jo and Ron are working out the rule for the function machine.



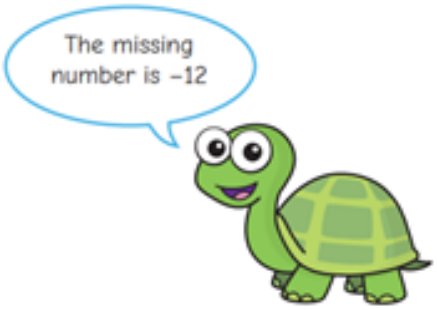


Who do you agree with?

Explain your answer.

Tiny is working out the missing number.

Input	9	7	3.5	–2
Output	19	17	13.5	

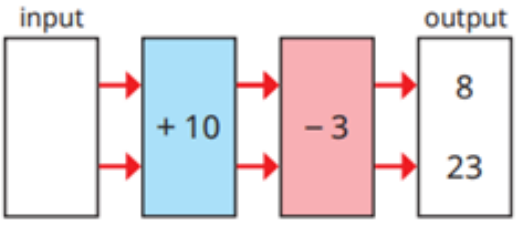


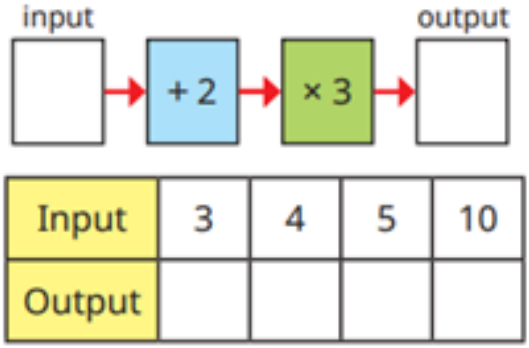
Explain Tiny's mistake.

What is the missing number?

Tuesday 21.2.23

MPI: Using two-step functions

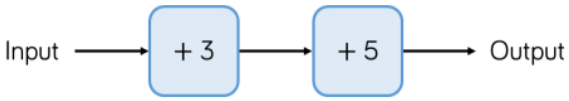




Here is a function machine.

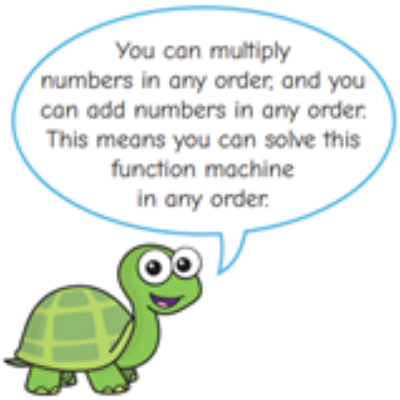
- What is the output if the input is 5?
- What is the input if the output is 19?
- What is the output if the input is 3.5?

How can you write this two-step machine as a one-step machine?



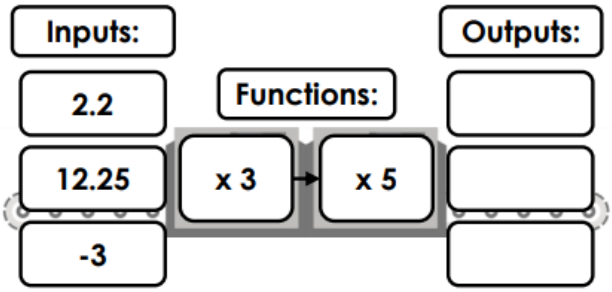
Check your answer by inputting values.

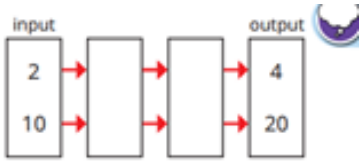
Tiny is using a 2-step function machine.

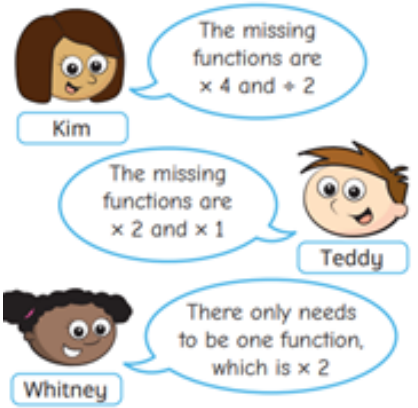


Do you agree with Tiny?

Explain your answer.







Who do you agree with?

What other functions would work?

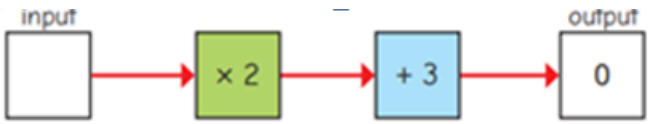
Complete the table for the given function machine.

Input	1	2	3	4	5
Output					

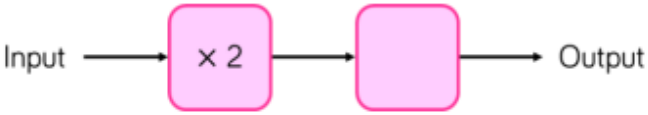
- What patterns do you notice in the outputs?
- What is the input if 20 is the output? How did you work it out?

Wednesday 22..2.23

MPI: Expressing missing numbers algebraically



This function machine gives the same output for every input.
For example if the input is 5 then the output is 5 and so on.



What is the missing part of the function?

What other pairs of functions can you think that will do the same?

c and d represent positive integer variables.

$c + d = 5$

Complete the table to show possible values of c and d.

c	d

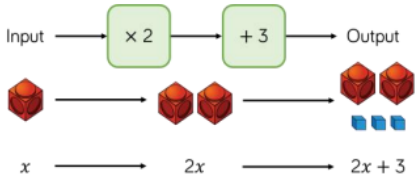
What is the same and what is different about these equations?

$4x + 5 = 13$

$4x - 5 = 15$

$8x - 5 = 35$

Eva is writing expressions for two-step function machines.



Use Eva's method to write expressions for the function machines.

Martin is x years old. Jennifer is 3 years younger than Martin. Connor is twice as old as Martin.

(a) *Write an expression for Jennifers age*

(b) *Write an expression for Conners age.*

(c) *Write an expression for the sum of the three ages*

Apples cost y pence each. Bananas cost y pence each. Write down an expression for the total cost, in pencil, of 3 apples and 5 bananas.

_____

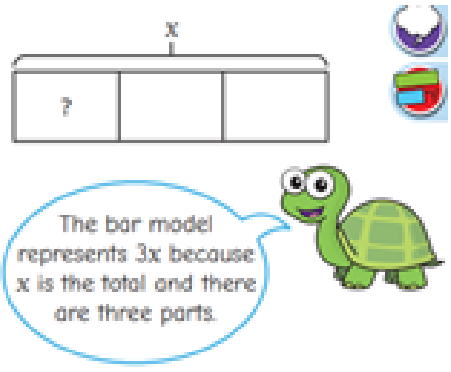
Thursday 23. 2.23

MPI: Substituting using simple expressions

Substitute the following to work out the values of the expressions.

$w = 3 \quad x = 5 \quad y = 2.5$

- $w + 10$
- $w + x$
- $y - w$



Match the expressions to their values.

If ◆ = 0.5 and ☾ = 8.

A. (◆ x ☾) – ◆	3.5
B. ◆ + ◆ + ☾	15.5
C. ☾ – ◆ + ☾	9

Match the expressions to their values.

If ★ = $\frac{1}{6}$ and ◣ = 2.7.

A. (12 ★ + 2 ◣) – ◣	4.7
B. (6 ★ + 10 ◣) + ◣	33.7
C. 24 ★ + 10 ◣ + ◣	29.7

Substitute the following to work out the values of the expressions.

$w = 10 \quad x = \frac{1}{4} \quad y = 2.5$

- $3y$
- wx
- $12 + 8.8w$
- $wy + 4x$

The perimeter of a rectangle is $12x$.

What could the sides of the rectangle be?

Tick the substitution used for this expression if the value is 93.

4q – r

q = 25, r = 7 ☐

q = 30, r = 25 ☐

True or false?

If c = $\frac{1}{12}$, d = 100 and e = 7.9.

(12c ÷ d) + e = 7.91

Who is correct?

a = 0.2, b = 25 and c = 10

Will: 5a x (3b – c) is 2 x 15 = 30

Lucy: 5a x (3b – c) is 1 x 65 = 65

Friday 24. 2.23

MPI: Using formula

Which of the following is a formula?

$P = 2l + 2w$ $\quad$ $3d + 5$ $\quad$ $20 = 3x - 2$

Explain why the other two are not formulae.

In your own way, show the distinction between an equation and a formula.

The rule for making scones is use 4 times as much flour (f) as butter (b).

Which is the correct formula to represent this?

A $\quad f = \frac{b}{4}$

B $\quad f = 4b$

C $\quad f = b + 4$

D $\quad 4f = b$

Explain why the others are incorrect.

This is the formula to work out the cost of a taxi.

$C = 1.50 + 0.3m$

C = the cost of the journey in £
m = number of miles travelled.
Work out the cost of a 12-mile taxi journey

Jack and Dora are using the following formula to work out what they should charge for four hours of cleaning.

Cost in pounds = 20 + 10 × number of hours

Jack thinks they should charge £60
Dora thinks they should charge £120

Who do you agree with?
Why?

Link each statement with a formula in the table below:

Statement		Formula
Total cost (in £C) for a show that costs £5 per ticket (n).		$C = \frac{100}{n}$
Cost (in £C) per person (n) of a bouncy castle that is £100 to hire.		$C = 500 - n$
Final cost (in £C) of a £500 television with £n cash back.		$C = 5n$
Total cost (in £C) of a job by a plumber who charges £30 per hour (n) plus a £20 call out fee.		$C = 30n + 20$