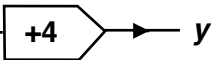
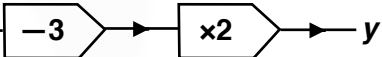


Function machines

Starter

1. A function machine is defined by $x \rightarrow$  y

- (a) Find the value of y when: (i) $x = 7$ (ii) $x = -10$
 (b) Find the value of x when: (i) $y = 9$ (ii) $y = 3$
 (c) Write an expression for y in terms of x .

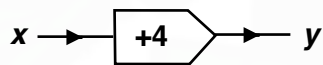
2. A function machine is defined by $x \rightarrow$  y

- (a) Find the value of y when: (i) $x = 8$ (ii) $x = 2$
 (b) Find the value of x when: (i) $y = 16$ (ii) $y = 24$
 (c) Write an expression for y in terms of x .

Notes

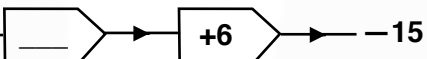
Function machines are logical ways to express a function.

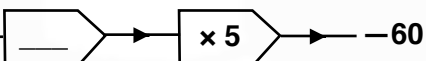
The number going into a function machine is called the **input** and the number coming out at the end is called the **output**. What is done to the input is called the **operation**.



For example, in the function machine above x is the input, $+4$ is the operation and y is the output. If the input is 6, the output is 10.

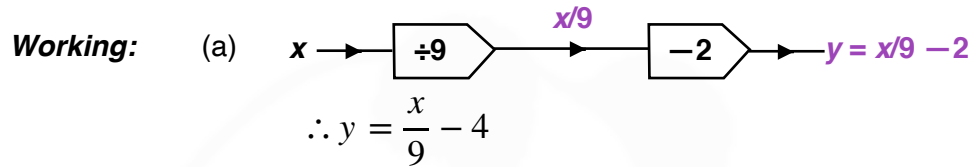
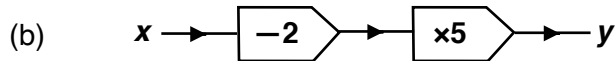
E.g. 1 Complete these function machines

(a) $7 \rightarrow$  -15

(b) $-8 \rightarrow$  -60

Working: (a) $-15 - 6 = -21$
 What can be done to get from 7 to -21 ?
Either $\times (-3)$ since $7 \times (-3) = -21$
or -28 since $7 - 28 = -21$
 So the gap could be $\times (-3)$ or -28

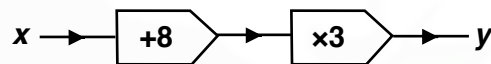
E.g. 2 Find a formula for y in terms of x :



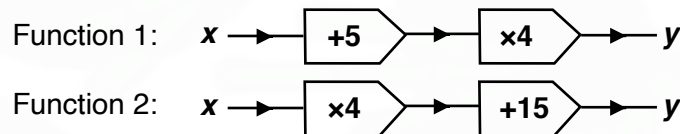
E.g. 3 Draw a function machine for:

(a) $y = 3(x + 8)$ (b) $y = \frac{10 - x}{7}$

Working: (a) We $+8$ to x before we multiply by 3



E.g. 4 Decide whether these machines give the same function. If they do not, edit one of the function machines so they are equivalent.



Video: [Function machines](#)

[Solutions to Starter and E.g.s](#)

Exercise

Worksheet: [Language of functions](#) (Answers included on pages 3 and 4)

| | |
|----------------------|--|
| 9-1 class textbook: | Function notation is not included in the OCR GCSE course |
| A*-G class textbook: | Function notation is not included in the OCR GCSE course |
| 9-1 homework book: | Function notation is not included in the OCR GCSE course |
| A*-G homework book: | Function notation is not included in the OCR GCSE course |

Summary

The number going into a function machine is called the **input** and the number coming out at the end is called the **output**. What is done to the input is called the **operation**.