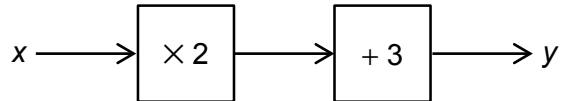
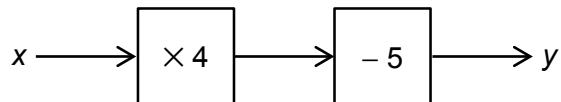


## Topic Check In - 6.05 Language of functions

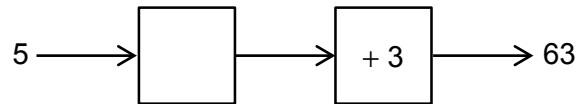
1. Use the function machine to find the value of  $y$  when  $x = 4$ .



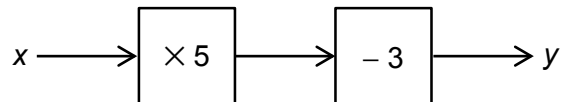
2. Use the function machine to find the value of  $y$  when  $x = -3$ .



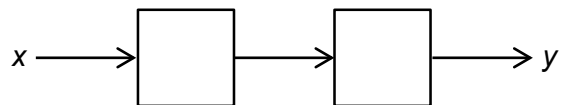
3. Complete the empty box in the function machine below.



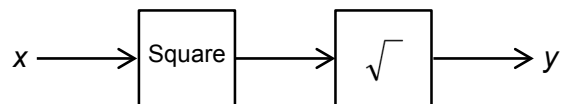
4. Find a formula for  $y$  in terms of  $x$  for this function machine.



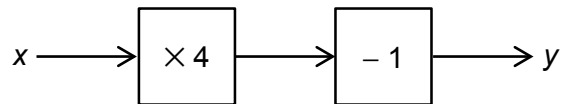
5. Complete the boxes to make the formula  $y = 3(x - 1)$ .



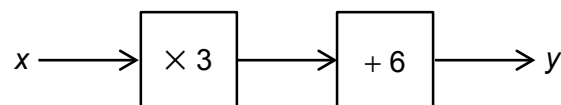
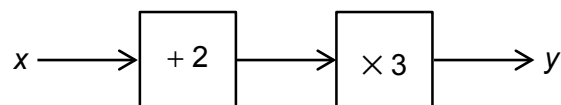
6. Explain why the value of  $y$  is always the same as the value of  $x$  for this function machine.



7. Jane says that if you double the value of  $x$  you double the value of  $y$  when using this function machine. Show that Jane is wrong.



8. Explain why for any value of  $x$  both function machines give the same value of  $y$ .

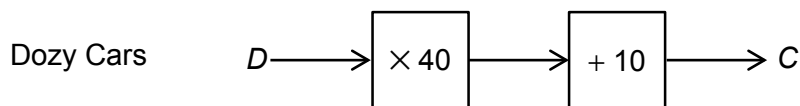
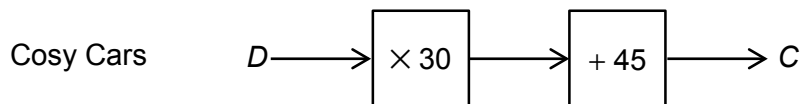


9. An approximate rule for changing from degrees Celsius ( $C$ ) to degrees Fahrenheit ( $F$ ) is:

Double  $C$  and add 30.

Draw a function machine to convert degrees Fahrenheit ( $F$ ) to degrees Celsius ( $C$ ).

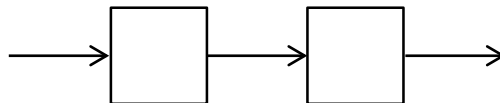
10. Tom has the choice of renting a car from either the Cosy Car Company or the Dozy Car Company. The function machines below show how total cost ( $C$ ) is calculated based upon the number of rental days ( $D$ ). Use the information to explain when it would be better to rent a car from the Cosy Car Company.



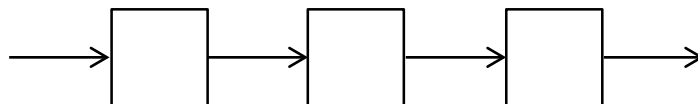
### Extension

When the numbers 2, 3, 4, 5 are inputs, the outputs are 3, 9, 15, 21.

- a) Create a 2-step function machine for these inputs and outputs.



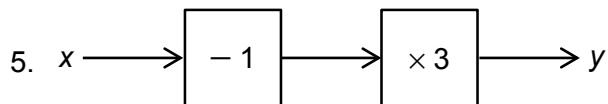
- b) Create a 3-step function machine for these inputs and outputs.



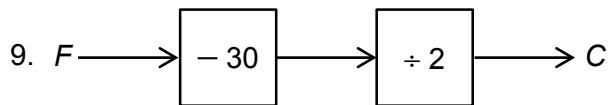
# GCSE (9-1) MATHEMATICS

## Answers

1. 11
2. -17
3.  $\times 12$
4.  $y = 5x - 3$



6. Square and  $\sqrt{\quad}$  are inverse (accept opposite) operations.
7. Choose an appropriate  $x$  value and its double. Show that these two inputs do not result in outputs that are different by a multiple of 2.  
e.g.  $x = 3$  gives  $y = 11$ , but  $x = 6$  gives  $y = 23$ .  
 $2 \times 11 = 22$  not 23.
8. First formula is  $y = 3(x + 2) = 3x + 6$ .  
Second formula is  $y = 3x + 6$ .



10. Results table or equivalent method.

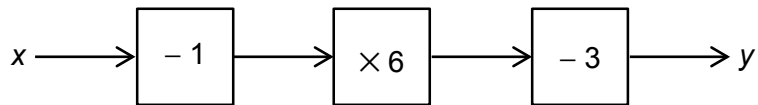
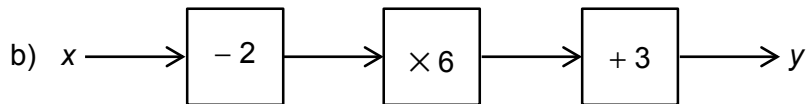
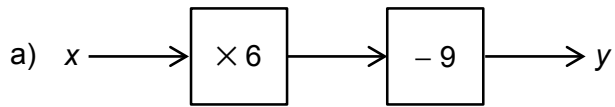
Days	1	2	3	4	5	6
Cosy	75	105	135	165	195	225
Dozy	50	90	130	170	210	250

Tom should rent his car from the Cosy Car Company if he wants a car for four or more days.



# GCSE (9-1) MATHEMATICS

## Extension



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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Use a function machine with positive numbers.			
AO1	2	Use a function machine with negative numbers.			
AO1	3	Find a missing operation in a function machine.			
AO1	4	Derive a formula from a function machine.			
AO1	5	Apply a formula to a function machine.			
AO2	6	Understand inverse operations.			
AO2	7	Understand order of operations in function machines.			
AO2	8	Understand order of operations in function machines.			
AO3	9	Translate a problem in words to a function machine.			
AO3	10	Solve a problem using function machines.			

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