Functions

- Finding the outputs of a two-step function machine
- Writing a two-step function using algebra

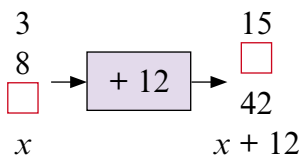
Keywords

You should know

explanation 1

1 Copy and complete these one-step function machines.

a



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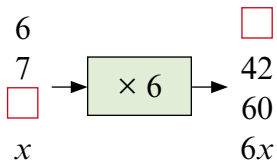

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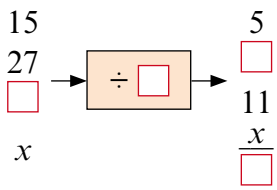

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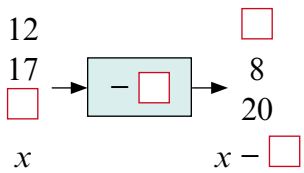

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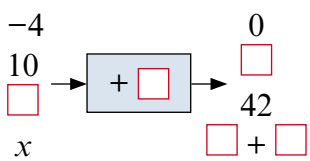

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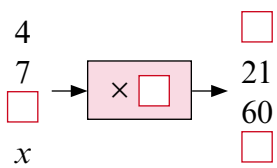
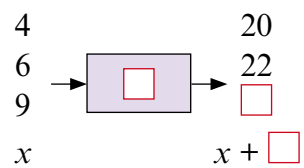
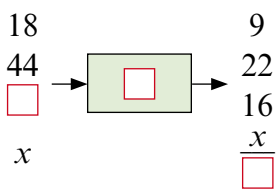


2 Copy and complete these one-step function machines.

a



b



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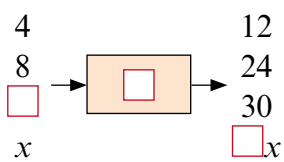

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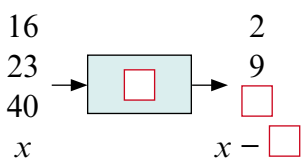

explanation 2

3 Write the output for each of the one-step function machines below. The first has been done for you.

a $x \rightarrow \boxed{\times 2} \rightarrow y$ $\quad y = 2x$

b $x \rightarrow \boxed{+ 2} \rightarrow y$

c $x \rightarrow \boxed{- 6} \rightarrow y$

d $x \rightarrow \boxed{\div 2} \rightarrow y$

e $x \rightarrow \boxed{- 4} \rightarrow y$

f $x \rightarrow \boxed{\times 3} \rightarrow y$

explanation 3 online

4 Copy and complete these function machines.

a $x \rightarrow 2x + 1$

x		$2x + 1$
8	$\times 2$, $+ 1$	17
12		
14		

b $x \rightarrow 2(x + 1)$

x		$2(x + 1)$
8	$+ 1$, $\times 2$	
12		
14		

5 Copy and complete these function machines.

a $x \rightarrow 3x - 2$

x		$3x - 2$
3	$\square$, $\square$	
6		
10		

b $x \rightarrow 3(x - 2)$

x		$3(x - 2)$
3	$\square$, $\square$	
6		
10		

c $x \rightarrow 2(x + 5)$

x		$2(x + 5)$
1	$\square$, $\square$	
5		
7		

d $x \rightarrow 2x + 5$

x		$2x + 5$
1	$\square$, $\square$	
5		
7		

e $x \rightarrow 3(x - 4)$

x		$3(x - 4)$
6	$\square$, $\square$	
9		
12		

f $x \rightarrow 3x - 4$

x		$3x - 4$
6	$\square$, $\square$	
9		
12		

6 Write the rule that links the input and output for each of these two-step function machines. Use algebra. The first has been done for you.

a $x \rightarrow \boxed{\times 2} \rightarrow \boxed{+ 4} \rightarrow y$ $y = 2x + 4$

b $x \rightarrow \boxed{+ 4} \rightarrow \boxed{\times 2} \rightarrow y$

c $x \rightarrow \boxed{- 1} \rightarrow \boxed{\times 2} \rightarrow y$

d $x \rightarrow \boxed{\times 2} \rightarrow \boxed{- 1} \rightarrow y$

e $x \rightarrow \boxed{\times 3} \rightarrow \boxed{+ 4} \rightarrow y$

f $x \rightarrow \boxed{+ 4} \rightarrow \boxed{\times 3} \rightarrow y$

g $x \rightarrow \boxed{\times 2} \rightarrow \boxed{- 6} \rightarrow y$

h $x \rightarrow \boxed{- 6} \rightarrow \boxed{\times 2} \rightarrow y$

7 Each table shows the inputs and outputs for a function machine.

i Copy and complete each function machine.

ii Write the rule that links the input and output numbers. Use algebra.

a $x \rightarrow \boxed{\times 2} \rightarrow \boxed{- \square} \rightarrow y$

Input x	Output y
1	1
2	3
3	5
4	7
5	9

b $x \rightarrow \boxed{\times 3} \rightarrow \boxed{+ \square} \rightarrow y$

Input x	Output y
1	4
2	7
3	10
4	13
5	16

c $x \rightarrow \boxed{+ 1} \rightarrow \boxed{\times \square} \rightarrow y$

Input x	Output y
1	4
2	6
3	8
4	10
5	12

d $x \rightarrow \boxed{\times 2} \rightarrow \boxed{+ \square} \rightarrow y$

Input x	Output y
1	4
2	6
3	8
4	10
5	12

***8** Explain why the functions in questions **7c** and **7d** give the same outputs.