Planner

Functions

- Writing a function machine as an equation
- Identifying and writing more complex rules linking inputs and outputs

Keywords

You should know

explanation 1a | explanation 1b | online

1 Write each function machine as an equation.

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

b $x \rightarrow \boxed{+ 5} \rightarrow y$

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

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

e $q \rightarrow \boxed{\times 3} \rightarrow \boxed{- 1} \rightarrow p$

f $t \rightarrow \boxed{\times 5} \rightarrow \boxed{- 4} \rightarrow y$

g $b \rightarrow \boxed{\times 4} \rightarrow \boxed{+ 1} \rightarrow a$

h $k \rightarrow \boxed{\times 2} \rightarrow \boxed{+ 5} \rightarrow j$

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

j $x \rightarrow \boxed{\div 2} \rightarrow \boxed{+ 2} \rightarrow y$

k $d \rightarrow \boxed{\div 3} \rightarrow \boxed{- 4} \rightarrow c$

l $g \rightarrow \boxed{\div 2} \rightarrow \boxed{\times 2} \rightarrow f$

2 What is the rule that links each set of input and output numbers?

i Write each rule as a function machine.

ii Write each rule as an equation.

a

Input (x)	Output (y)
1	4
2	5
3	6
4	7
5	8

b

Input (x)	Output (y)
1	3
2	6
3	9
4	12
5	15

c

Input (x)	Output (y)
1	$\frac{1}{2}$
2	1
3	$1\frac{1}{2}$
4	2
5	$2\frac{1}{2}$

explanation 2a | explanation 2b | online

3 Write an equation for each function machine. Simplify where possible.

a $x \rightarrow$ [+ 2] $\rightarrow$ [− 7] $\rightarrow y$

b $a \rightarrow$ [÷ 3] $\rightarrow$ [× 6] $\rightarrow b$

c $d \rightarrow$ [− 3] $\rightarrow$ [+ 4] $\rightarrow c$

d $g \rightarrow$ [÷ 2] $\rightarrow$ [× 2] $\rightarrow f$

e $x \rightarrow$ [÷ 2] $\rightarrow$ [× 4] $\rightarrow y$

f $x \rightarrow$ [÷ 4] $\rightarrow$ [× 2] $\rightarrow y$

4 Use algebra to write the rule for each set of input and output numbers.
Write each rule

i in the form $x \rightarrow \square$

ii in the form $y = \square$

a

Input (x)	Output (y)
1	0
2	2
3	4
4	6
5	8

b

Input (x)	Output (y)
1	5
2	9
3	13
4	17
5	21

c

Input (x)	Output (y)
1	6
2	9
3	12
4	15
5	18

d

Input (x)	Output (y)
1	0
2	3
3	6
4	9
5	12

e

Input (x)	Output (y)
1	1
2	1.5
3	2
4	2.5
5	3

f

Input (x)	Output (y)
1	$\frac{3}{4}$
2	$\frac{3}{2}$
3	$2\frac{1}{4}$
4	3
5	$3\frac{3}{4}$