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# Show that...

① Show that  $2\left(x + \frac{1}{2}\right) \equiv x + x + 1$  (1 mark, ★★)

Multiply the brackets and then simplify, to show the left-hand side and the right-hand side are the same.

② Show that  $(x + 5)(x - 5) + 9 \equiv (x + 4)(x - 4)$  (2 marks, ★★★)

③ Show that the sum of three consecutive numbers is a multiple of 3. (2 marks, ★★★)

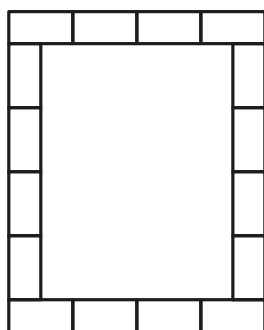
Consecutive numbers follow each other in order. For example, 1, 2, 3 or 7, 8, 9... Notice that each consecutive number is one more than the previous number. This means you can write three consecutive numbers as  $n, n + 1, n + 2$ .

④ Here is a path around a pond.

The path is made of concrete slabs. All the concrete slabs are the same size.

Each slab has a length of  $x$  cm and a width of  $y$  cm.

The perimeter of the pond is  $P$  cm. (★★★★)



**DO IT!**

Write all the information you know on the diagram.  
Write the distance between the corner and the end of a slab at the top and bottom of the pond, in terms of  $x$  and  $y$ :

a Show that  $P = 16x - 4y$  (2 marks)

b Sanjit says that when  $x$  and  $y$  are whole numbers  $P$  is always a multiple of 4. Is Sanjit correct? Explain. (2 marks)

.....  
 .....

[Total: 4 marks]

# Functions

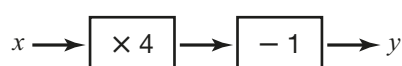


## SNAPIT! Functions and rules

A function is a rule. The inverse function reverses the rule.

So, if a function is  $\times 2 + 1$ ; then the inverse function is  $-1 \div 2$

- ① Here is a function machine. (★★)



This function machine tells you that the rule is: take  $x$ , multiply by 4, subtract 1, and you get  $y$ .

- a Work out  $y$  when  $x$  is 3. (1 mark)

.....

- b Work out  $x$  when  $y$  is 23. (2 marks) ← Use the inverse function to work out  $x$ .

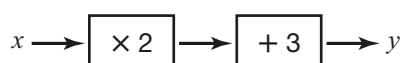
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- c Write the equation in terms of  $x$  and  $y$ . (1 mark)

.....

**[Total: 4 marks]**

- ② Complete the table for the function machine. (2 marks, ★★★)



$x$	$y$
-2	
0	
	9

- ③ Complete the table for the function  $y = \frac{x}{2} + 1$ . (2 marks, ★★★★★)

$x$	$y$
-2	
1	
	5