Contents

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, ★★★★)

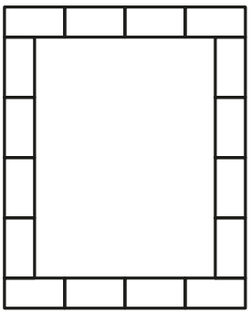
Consecutive numbers follow each other in order. For example, 1, 2, 3 or 7, 8, 9… Notice that each consecutive number is one more than the previous number. This means you can write three consecutive numbers as n, $n + 1$, $n + 2$.

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.

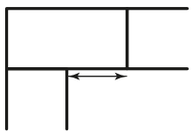
The perimeter of the pond is P cm. (★★★★★)



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)

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[Total: 4 marks]

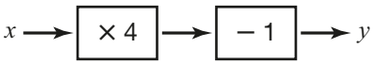
Functions

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)

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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)

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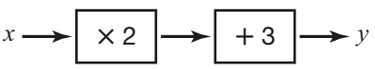
[Total: 4 marks]

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