UNDOING

Amy and her friends have built some functions and they are challenging each other to find the input when they know an output.

Amy's function

$a \Rightarrow \boxed{+5} \Rightarrow a+5$

They think the inputs to their functions that all give the output 10 are 5 for Amy's function, 4 for Busi's, 2½ for Chris's and 5⅓ for Dudu's. Do you agree? Why or why not?

Busi's function

$b \Rightarrow \boxed{\times 3} \Rightarrow \boxed{-2} \Rightarrow 3b-2$

Chris's function

$c \Rightarrow \boxed{\div 2} \Rightarrow \boxed{\times 3} \Rightarrow \boxed{+5} \Rightarrow 3c/2 + 5$

Dudu's function

$d \Rightarrow \boxed{-2} \Rightarrow \boxed{\times 3} \Rightarrow \boxed{\div 2} \Rightarrow \boxed{+5} \Rightarrow 3(d-2)/2+5 = 3d/2+2$

Busi says that she goes back in the other direction to find inverses undoing the functions one by one. For her function, to find the input that gives the output 10 she works out 10+2=12 and 12÷3=4.

Amy says she uses inverse functions because they undo the operation of a function like undoing your shoelaces. She says that + and – undo each other and × and ÷ undo each other.

$\boxed{-2}$ $\boxed{\times 3}$ $\boxed{\div 2}$ $\boxed{+5}$ What are the four inverse functions for these simple functions?

Can you find the inputs for Amy's, Busi's, Chris's and Dudu's functions corresponding to an output of 20?

With a partner decide on one of the functions, or build another function of your own. Give each other an output and challenge the other to find the input. Which of you can do this most quickly and accurately?

The formulas for the functions are given in the diagram.

HELP

The important idea to understand is that + and – are inverse operations and × and ÷ are inverse operations. Just like locking and unlocking a door these pairs of operations reverse the action of each other.

The inverse of Chris's function is $f^{-1}(x) = \frac{2}{3}(x - 5)$.
Can you find the inverse of Amy's. Busi's and Dudu's functions?

NEXT

For each of the functions: f(x) = ⅜(x -7) and f(x)=⅚x + 2
1. Break each function up into simple steps.
2. Find the formula for the corresponding inverse function.
3. Find the input for the outputs 3, 12 and 27.
4. With a partner both think of an input and find its output for one of these functions, then exchange outputs and see who is first to find the input.