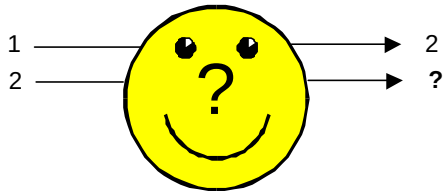
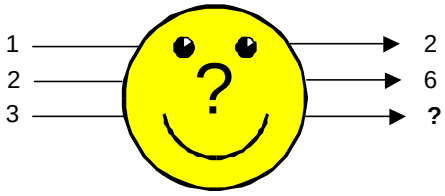
GUESS MY RULE 1

Smiley is thinking of a secret function rule. He will not tell us what the function rule in his head is, but he will tell us that if the input number is 1, his rule gives the output number 2.



You must guess his secret function rule, by *predicting* his output number if the input is 2. Smiley will tell you if you are correct and give you the right answer if you are wrong.

Smiley says that for his rule, the output for 2 is 6. Now *predict* the output number for 3 and see if Smiley agrees ***** . . .



Now play with a classmate. Think of a secret function rule, give your classmate some input-output numbers and see if he can find your rule . . .

1.

2.

3.

* For an input of 3 my output is 12, and for 15 my output is 240

GUESS MY RULE 2

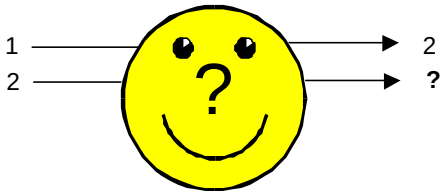
What is the next number in this sequence:

2; 4; 6; 8; ?

We would probably all say 10.
This is based on an implicit function rule $2n$. But as the table below shows, the next value may be 34, based on another valid function rule:

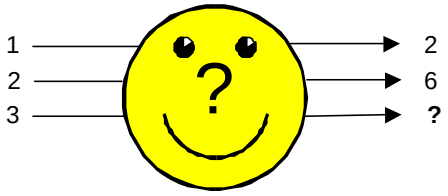
n	1	2	3	4	5	6
$2n$	2	4	6	8	10	12
$2n + (n-1)(n-2)(n-3)(n-4)$	2	4	6	8	34	132

Smiley is thinking of a secret function rule. He will not tell us what the function rule in his head is, but he will tell us that if the input number is 1, the output number is 2.



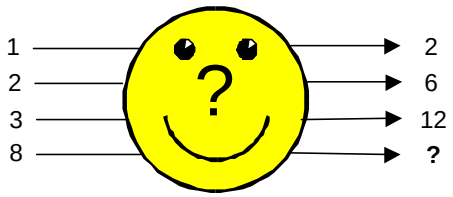
Give *at least 10* different function rules generating the pair (1;2) and find the corresponding output value for 2.

Smiley says that for his rule, the output for 2 is 6.
Find the *linear function* generating the pairs (1;2) and (2;6) and predict the output value for 3.



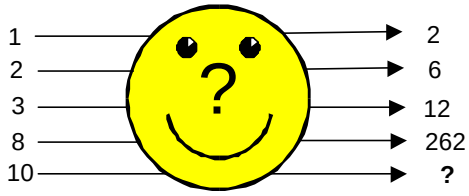
Is there *only one* such linear function? Explain!

Smiley says that for his rule, the output for 3 is 12.
Find a *quadratic function* generating the pairs (1;2), (2;6) and (3;12) and predict the output value for 8



Is there *only one* such quadratic function? Explain!

Smiley says that for his rule, the output for 8 is 262.
Find a *cubic function* generating the pairs (1;2), (2;6), (3;12) and (8;262) and predict the output value for 10



Is there *only one* such cubic function? Explain!

Actually, my rule is $x^3 - 5x^2 + 12x - 6$