Making Multiplication Facts Meaningful

and

Their Practice Interesting

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2016 NCTM Annual Conference
April 15, 2016

X	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Taxman

The Taxman is a one player game. (Several people can play together acting as the one player.)

You, the player, will be given a starting number such as 17, and you should write all the numbers from one through your number on the paper (1 through 17 in this case). Then make a table like the one below, with columns for the Taxman and the player.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Player	Taxman

First the player picks a number, writes it in her/his column, and crosses it off the list. Next, s/he takes all the divisors of that number that have not been crossed off, and writes them in the Taxman's column. Then s/he crosses those numbers off the list.

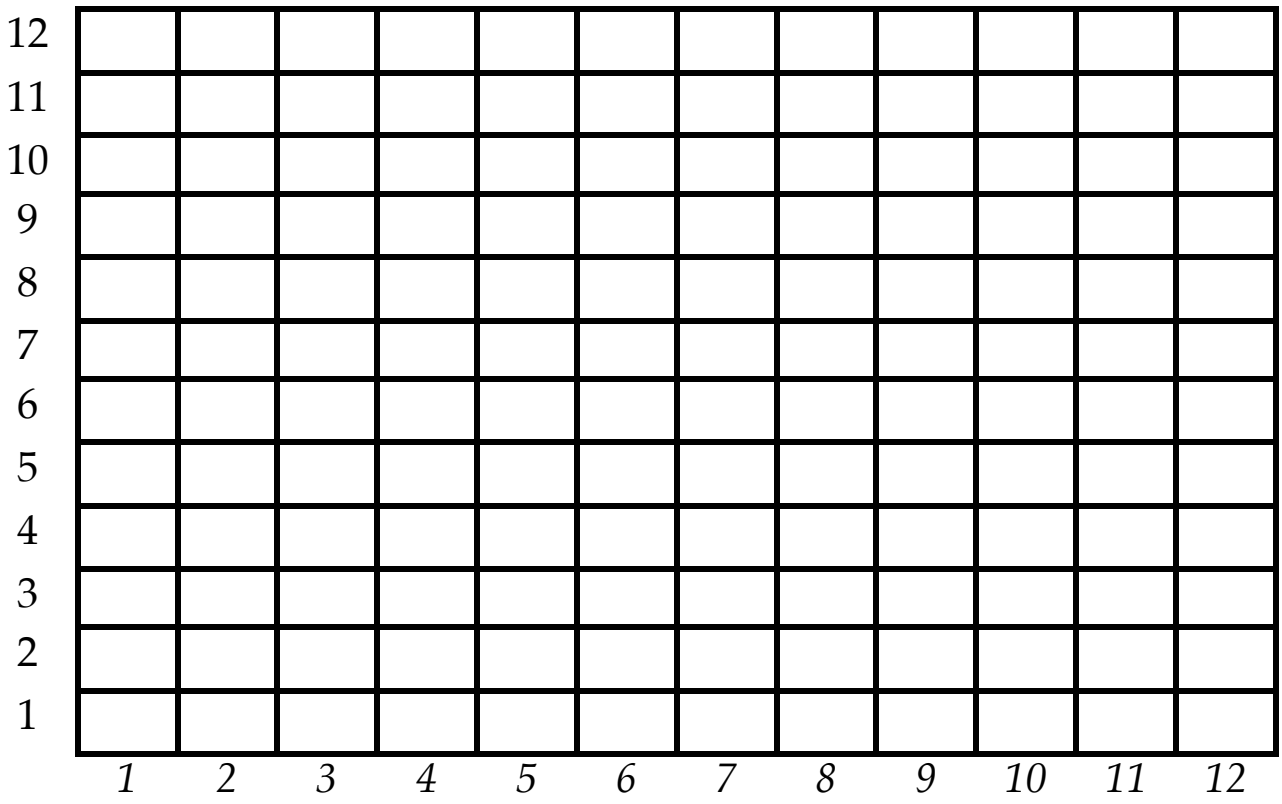
Now, s/he picks another number that has not been crossed off, writes it in her/his column, crosses it off the list, gives the divisors that haven't been crossed off yet to the Taxman, and crosses the divisors off the list.

The game continues in this way, however, there is just one rule to follow:

The Rule: Every number the player picks must have at least one divisor that has not been crossed off the list yet. That is, the Taxman must get *something* on every turn!

When the player can pick no more numbers while following the rule, the Taxman gets all the numbers that are left. The numbers in each column are then added to give the Player's and Taxman's total scores. The one with the highest score wins.

Try to get the highest score possible for a given starting number and show that no higher score is possible.


12
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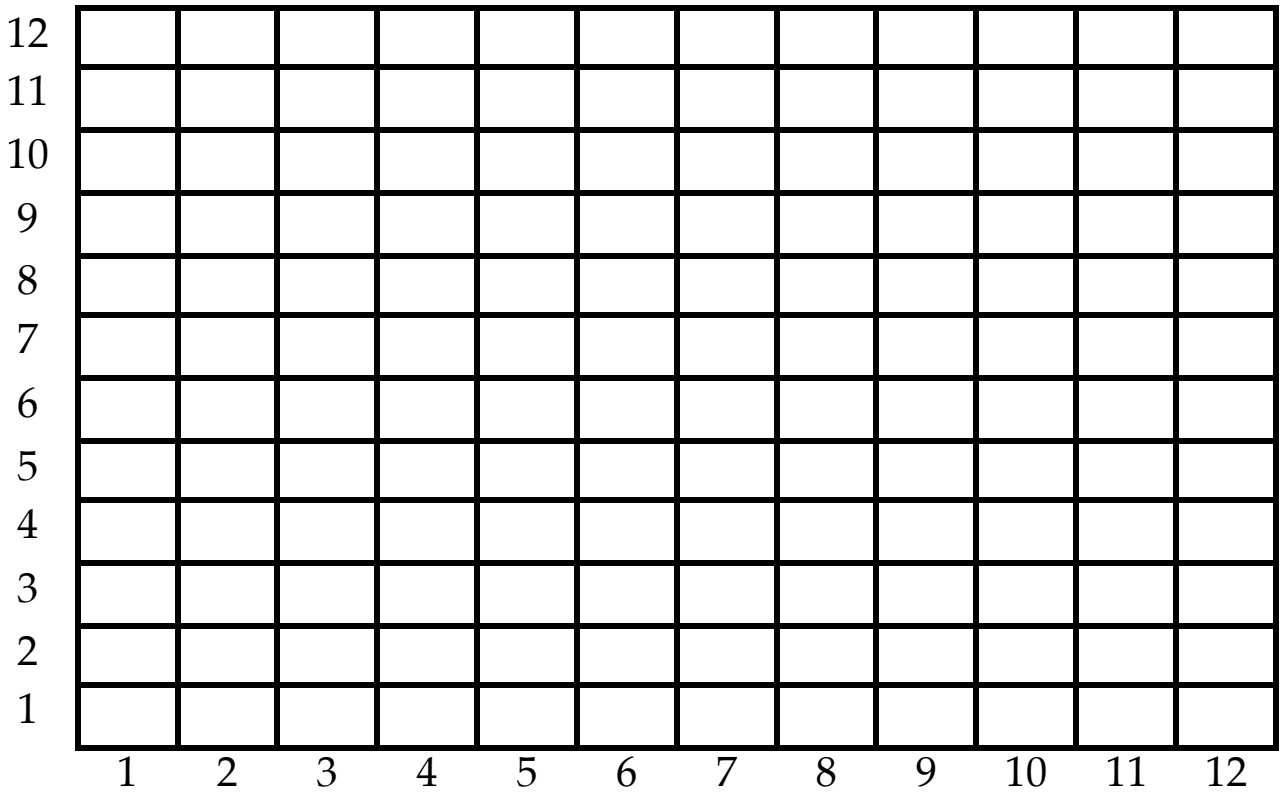
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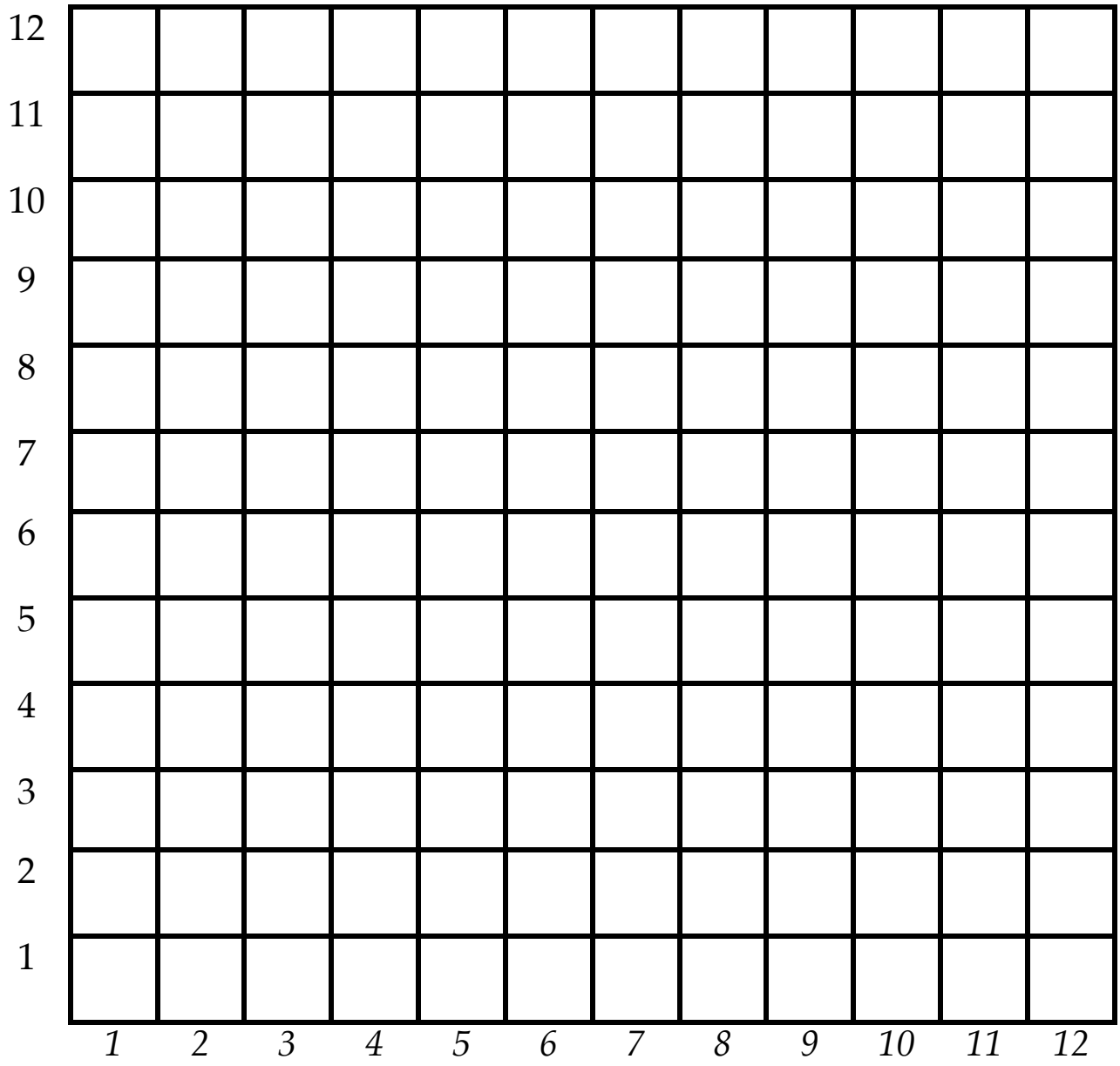
12
11
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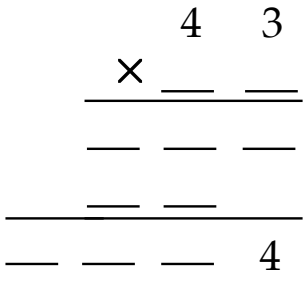
1
1 2 3 4 5 6 7 8 9 10 11 12

Find the missing digits for the multiplication problems below.
Explain clearly how you got each number.



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