

GABRIEL'S PROBLEM

①

2	3	4	24
5	1	8	40
6	7	9	378
60	21	288	

[1-9]

Prime factors

$$24 = 2 \times 2 \times 2 \times 3$$

$$40 = 2 \times 2 \times 2 \times 5$$

$$378 = 2 \times 3 \times 3 \times 3 \times 7$$

$$60 = 2 \times 2 \times 3 \times 5$$

$$288 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$$

$$21 = 3 \times 7$$

*First work out the factors/prime factors of all the products given. Then I will use trial and error to work out the places of the number. I will start on the first column. Using trial and error I place 2, 5, 6 (going down). I can see that 2 is a factor of 24; 5 is a factor of 40 and 6 is a factor of 378. Moving on to the next column I can see that the only way to make 21 is 3 and 7 and I can see that 3 is a multiple of 24 there I placed it at the top. Looking at column I can see that 7 is a factor of 378 so it is placed in that section. It then makes sense to place the 1 in the middle. Lastly, moving to the final column, we can just multiply up the numbers in each row and then divide it by the product given it will then give us our final numbers to place in the grid.

③

1	4	7	28
8	6	3	144
5	2	9	90
40	48		

[1-9]

Prime factors -

$$28 = 2 \times 2 \times 7$$

$$90 = 2 \times 5 \times 3 \times 3$$

$$40 = 2 \times 5 \times 2 \times 2$$

$$48 = 3 \times 2 \times 2 \times 2 \times 2$$

$$144 = 2 \times 2 \times 3 \times 2 \times 2 \times 3$$

We can firstly see that all products are given for the rows and columns except for one (the last one). This means that the numbers in the column above does not matter what it multiplies too.

Starting with the first column we can solve that 1 needs to be at the top because between 28 and 40 1 is a common number. Then we can place 8 and 5 in the first ~~column~~ ^{row}. Moving on to the next column we can use parts of the Prime factors that we worked out. $3 \times 2 \times 2 \times 2 \times 2$ can be multiplied out to give $(3 \times 2) = 6$, $(2 \times 2) = 4$ and 2 . Using trial and error

We can check whether the numbers also go into the numbers given along the row. Then for the last column you can multiply the other two numbers already placed and divide it by the given product at the end on the row.