

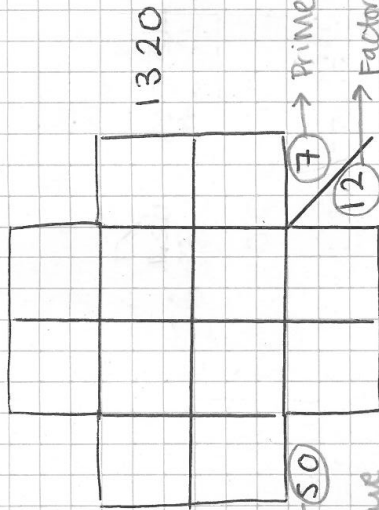
STEP BY STEP GUIDE TO SOLVING

Gabriel (le)'s

?	?	?
?	?	?

problem

STEP 1: The problem (Analyse it)



Factors of 50:

- 1
- 2
- 5
- 10

These factor pairs have numbers not included in 1-12, so 10 and 5 have to be used.

Using numbers 1-12, place the numbers correctly in each box so that all rows and columns ~~add up~~ multiply, to give you the number shown beside the row or column.

Can only be made by 1+7.

Prime number by 1+7.

Factors of 12: 1 6 2 3 4

After analysing the problem cross out the numbers used on a number line:

X	2	3	4	5	6	7	8	9	10	11	12
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STEP 2: Analyse the remaining numbers:

what are the factors of these two → 396 and 1320
 numbers? Can we make them with our remaining numbers?

Both 1320, 396 have four spaces to fill, so that (when the numbers are multiplied) they equal 1320, 396.

Let's start with 1320:

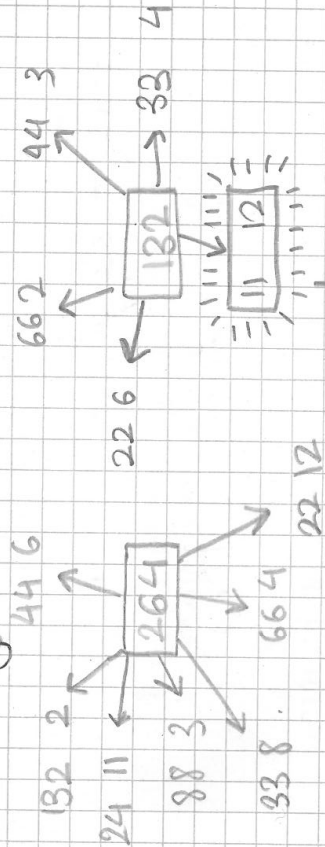
				1320
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Two of these spaces are already filled with either, 5 or 10 and 7 or 1.

$$\begin{aligned}
 1320 \div 7 &= 1320/7 \\
 1320 \div (5 \times 7) &= 264/7 \\
 1320 \div (10 \times 7) &= 132/7 \\
 1320 \div 5 &= 264 \\
 1320 \div 10 &= 132
 \end{aligned}$$

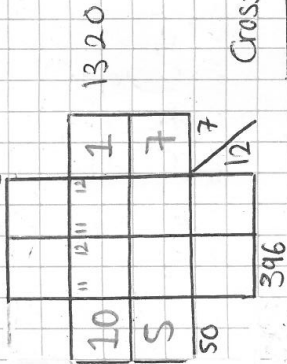
7 is not in the line therefore 1 is in the line.

Can we make the remaining numbers with our remaining number line?



None of these pairs have both numbers in our number line, so 5 is not in the row.

STEP 2: Continuing...

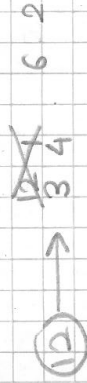


Cross off the remaining numbers



Now you cannot use 12, in the factors of 12.

Let's cross it off...



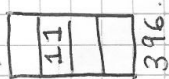
This number is either 11 or 12.



$$396 \div 11 = 36$$

$$396 \div 12 = 33$$

As there are three spaces available, and 1 is being used up, and 33 can only be made up of prime numbers: 3 and 11, so 11 fills the space.



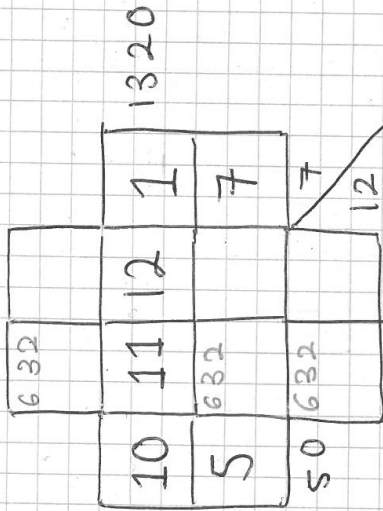
Now let's find factors of 36, with the remaining numbers:

6, 3, 2

36

This is the only triplet that makes 36, with the remaining numbers.

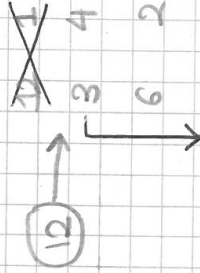
STEP 3: what's left...



396



we now need to make 12.



This is the only factor pair left...

6 and 2 are being used in the same column, so we can cross it off...



STARTER:

① Simplify $\frac{14\sqrt{3}}{4\sqrt{3}} + 2\sqrt{3} = 6\sqrt{3}$ ✓

② Find the coordinates of the vertex of the graph of $y = x^2 + 2x - 1$

$y = (x+1)^2 - 2$ $(-1, -2)$ ✓

③ Use the formula $v = vt + at$ to find v when $v = 16$, $a = 8$, $t = 8$.

$v = 16 + (8 \times 8)$

$v = 16 + 64$

$v = 80$ ✓

④ Expand and simplify $(x-2)(x-3)(x+3)^x$

⑤ Write down the exact value of $\cos 0^\circ = 1$ ✓

⑥ A block has a volume of 24 cm^3 and a density of 6 g/cm^3 . Calculate the mass.

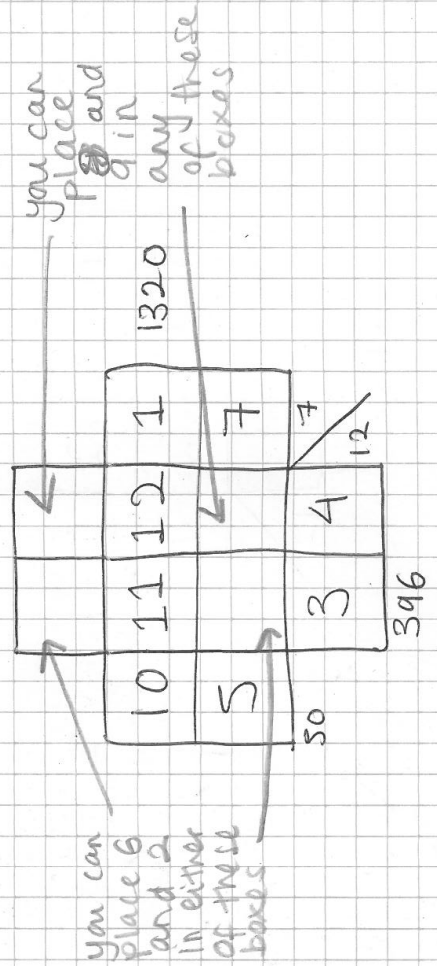
$d = \frac{m}{V}$

$m = d \times V$
 $m = 6 \text{ g/cm}^3 \times 24 \text{ cm}^3$
 $m = 144 \text{ g}$ ✓

⑦ If $f(x) = 2x - 4x^2$ find the value of $f(1)$

$f(1) = 2(1) - 4(1)^2$
 $= 2 - 4$
 $= -2$

STEP 4: filling in the blanks



STEP 5: the solutions

