Problem There are four magnificent cities named *Happy*, *Content*, *Merry*, and *Jolly*. One day, countable virus named *MathVirus* has entered each city.

The number of viruses that entered the *Merry* city is the product of the number of virus that entered *Happy* city and *Content* city. Moreover, the sum of the number of virus that entered *Happy* city and *Content* city equals the number of virus that entered *Jolly* city. In addition, the number of virus that entered *Merry* city squared is equal to the product of 2025 and the number of virus that entered *Jolly* city squared.

A biologist in *Happy* city is required to count the number of the *MathVirus* that spread to *Happy* city. Please help the biologist to find all possible number of virus that dispersed to *Happy* city for further investigation! (The number of *MathVirus* for each city does not change.)

Solution
Let
the number of virus in *Happy* city H,
the number of virus in *Content* city C,
the number of virus in *Merry* city M,
the number of virus in *Jolly* city J.

M=HC
J=H+C
M^2=2025J^2

Because the number of the virus in each city is countable, the quantity of *MathVirus* in each city is natural number.
$\therefore M = 45J$

Because virus has entered each city, J cannot be zero.
$\frac{M}{J} = 45$

By substitution,
$\frac{HC}{H+C} = 45$
$HC = 45H + 45C$
$HC - 45H - 45C = 0$
$HC - 45H - 45C + 2025 = 2025$
$(H - 45)(C - 45) = 2025$

The possible values for $H - 45$ are the factors of 2025.

$$
\begin{aligned}
H - 45 &= 1 \\
H - 45 &= 3 \\
H - 45 &= 5 \\
H - 45 &= 9 \\
H - 45 &= 15 \\
H - 45 &= 25 \\
H - 45 &= 27 \\
H - 45 &= 45 \\
H - 45 &= 75 \\
H - 45 &= 81 \\
H - 45 &= 135 \\
H - 45 &= 225 \\
H - 45 &= 405 \\
H - 45 &= 675 \\
H - 45 &= 2025
\end{aligned}
$$

Therefore, the possible values of H are 46, 48, 50, 54, 60, 70, 72, 90, 120, 126, 180, 270, 450, 720, 2070.

Conclusion: **The possible numbers of virus that entered to *Happy* city are 46, 48, 50, 54, 60, 70, 72, 90, 120, 126, 180, 270, 450, 720, 2070**.