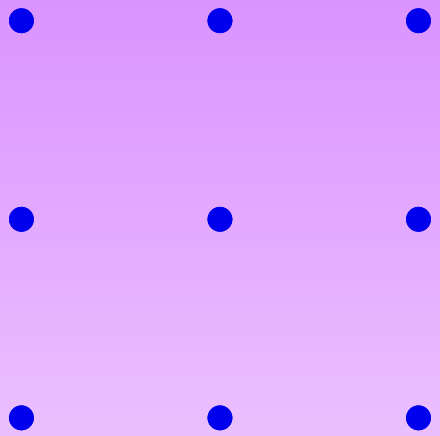
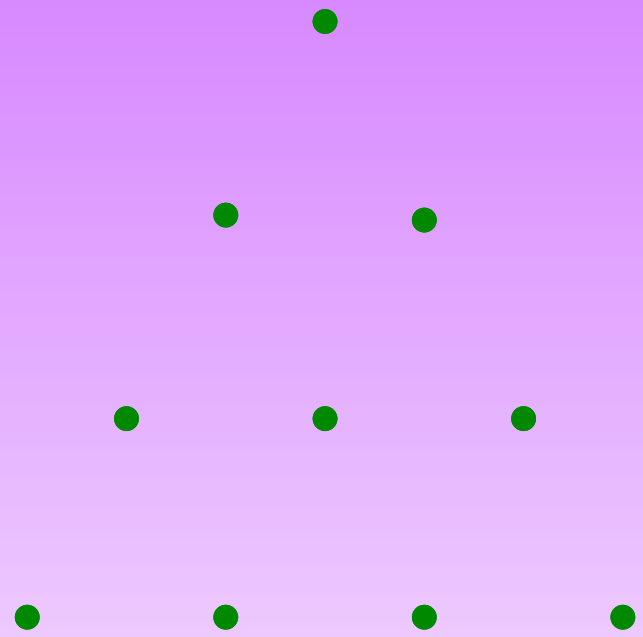
Square and Triangular Numbers



$3^2 = 9$

Square Number

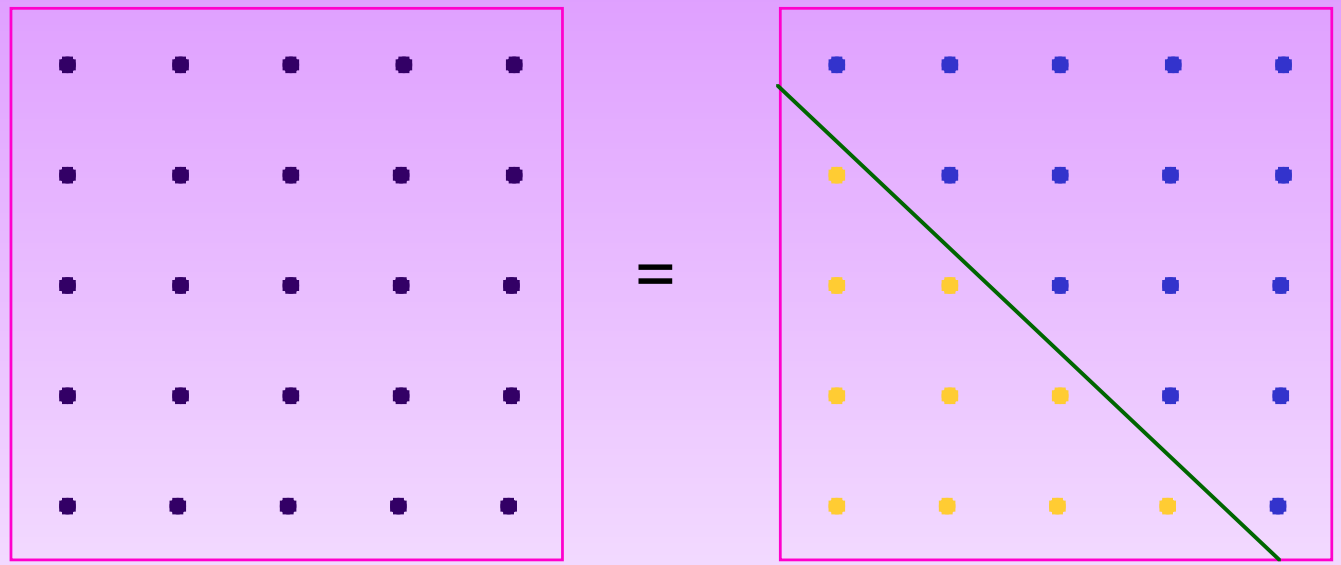


10

Triangular Number

Relationships Between Numbers

- **Example:** Square numbers can be subdivided by a diagonal line into the sum of two triangular numbers.
  - Square number 25 = triangular number 10 + triangular number 15.

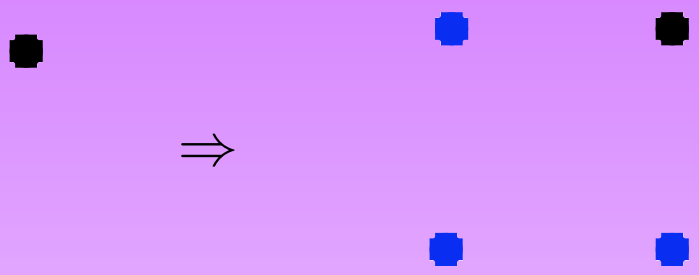


25 = 10 + 15

Square Numbers

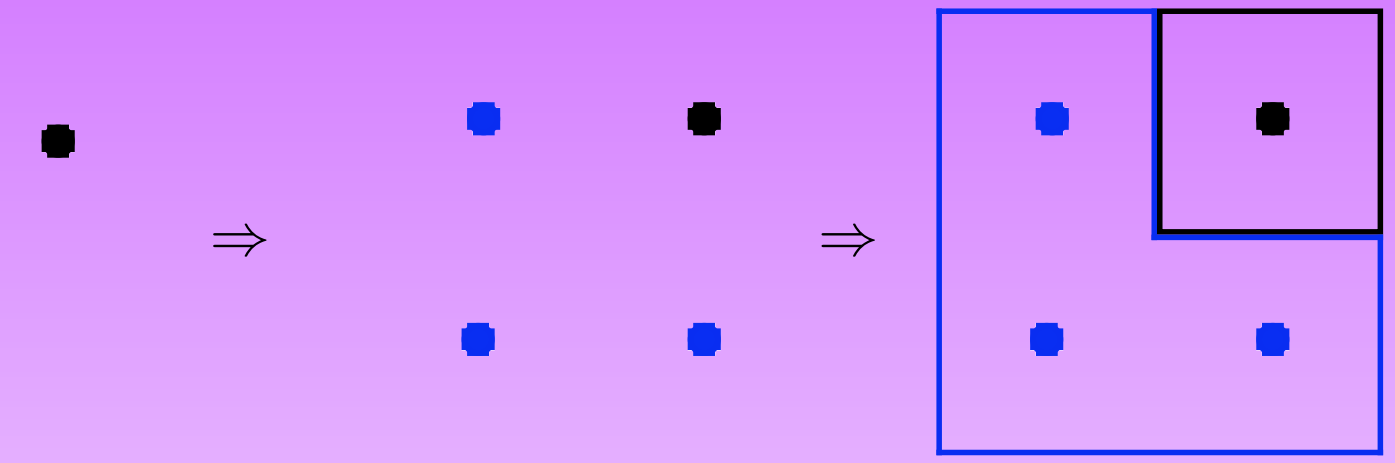
1^2

Square Numbers



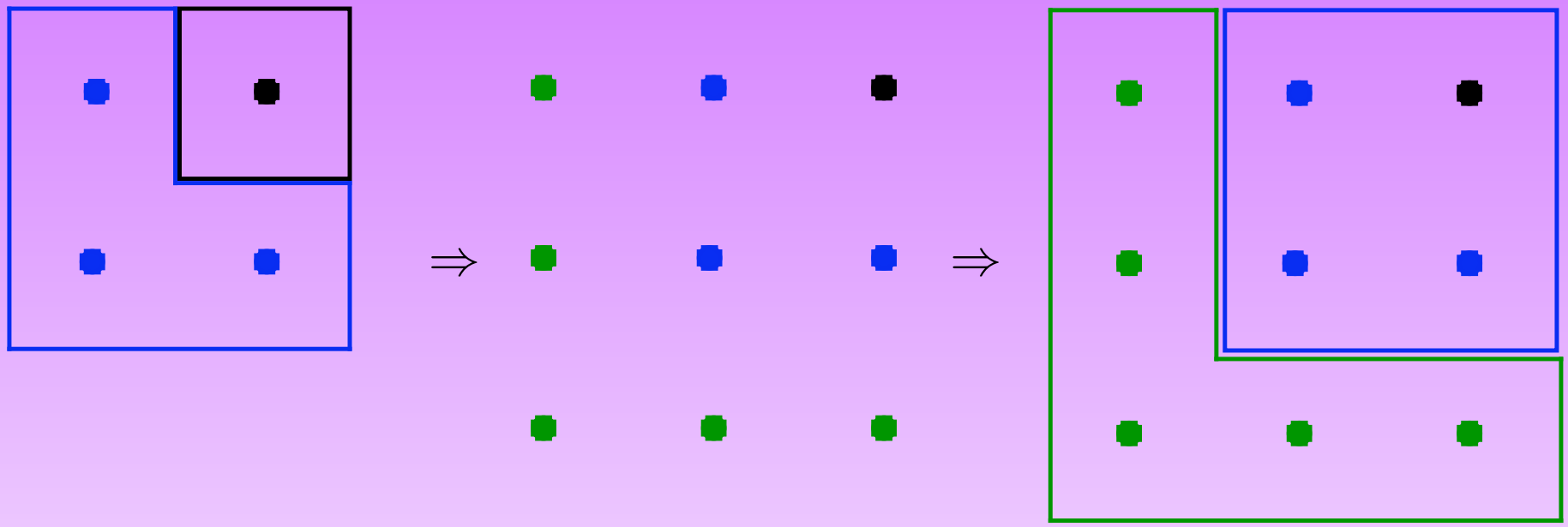
1^2 1^2+3

Square Numbers



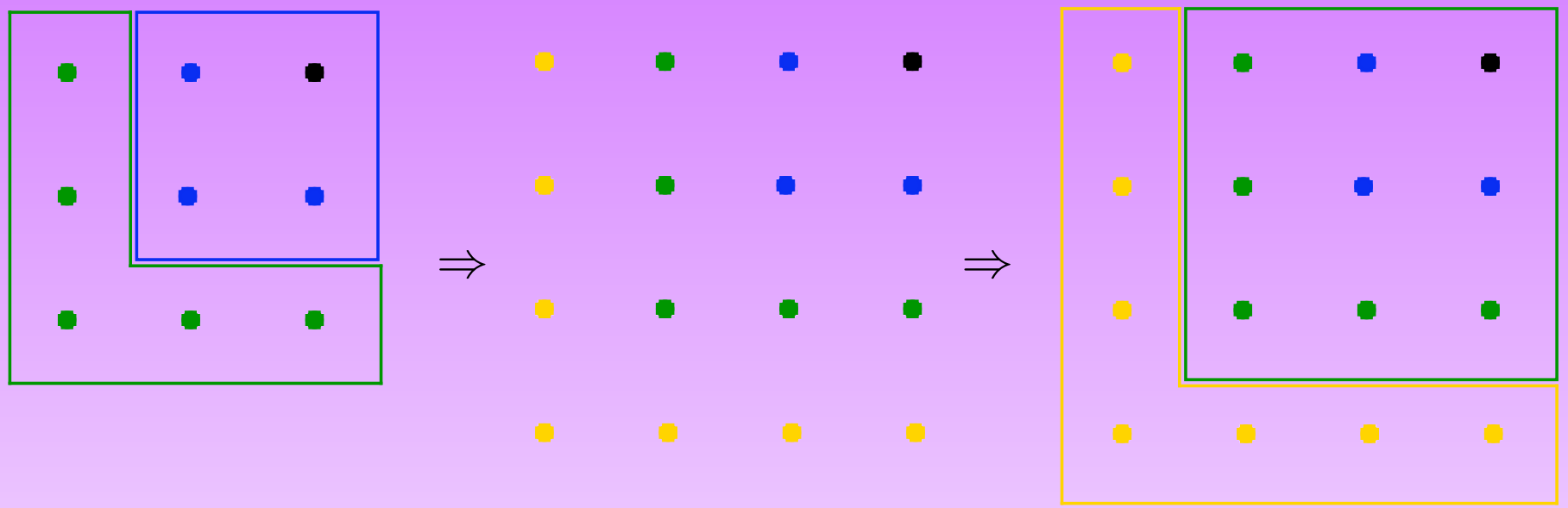
1^2 1^2+3 2^2

Square Numbers



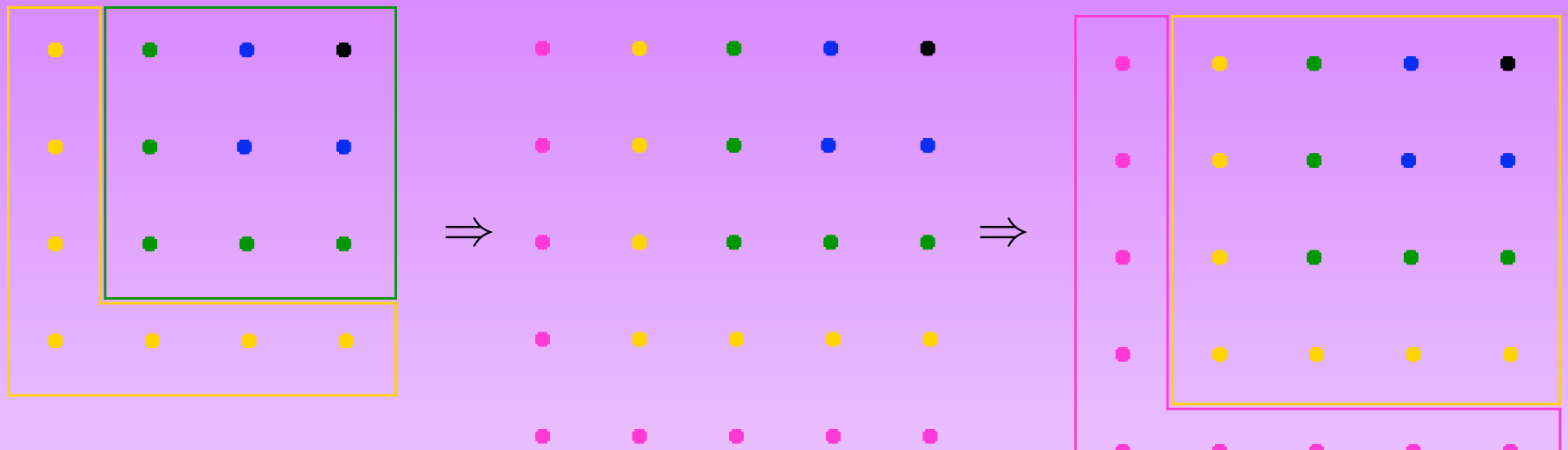
2^2 2^2+5 3^2

Square Numbers



3^2 3^2+7 4^2

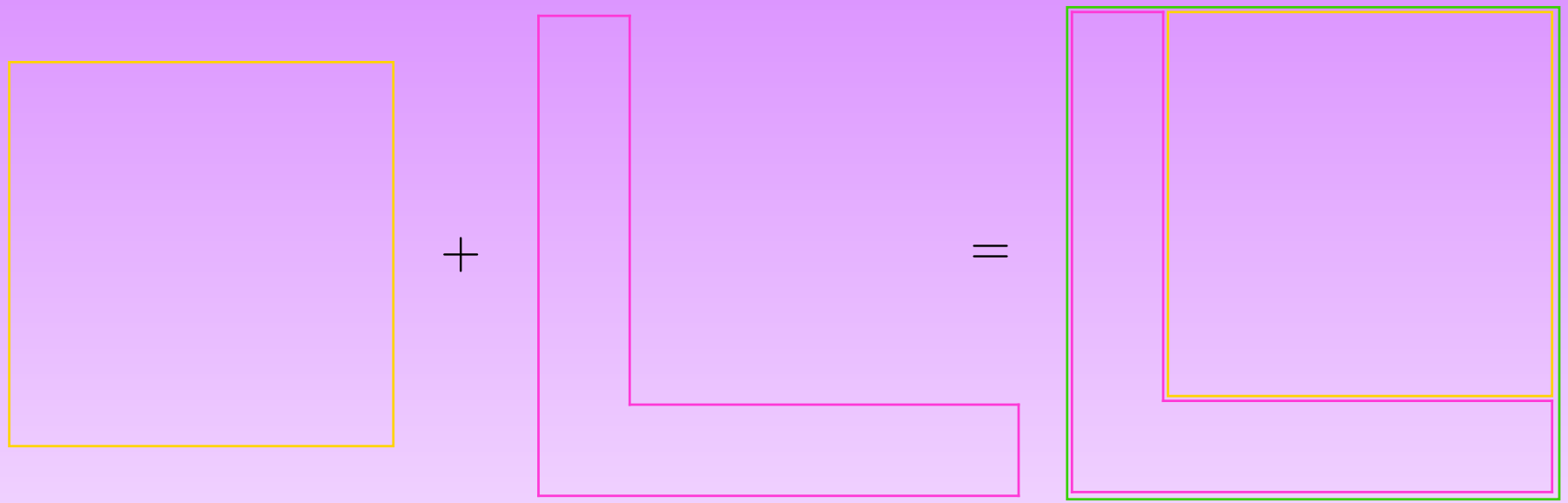
Square Numbers



4^2 4^2+9 5^2

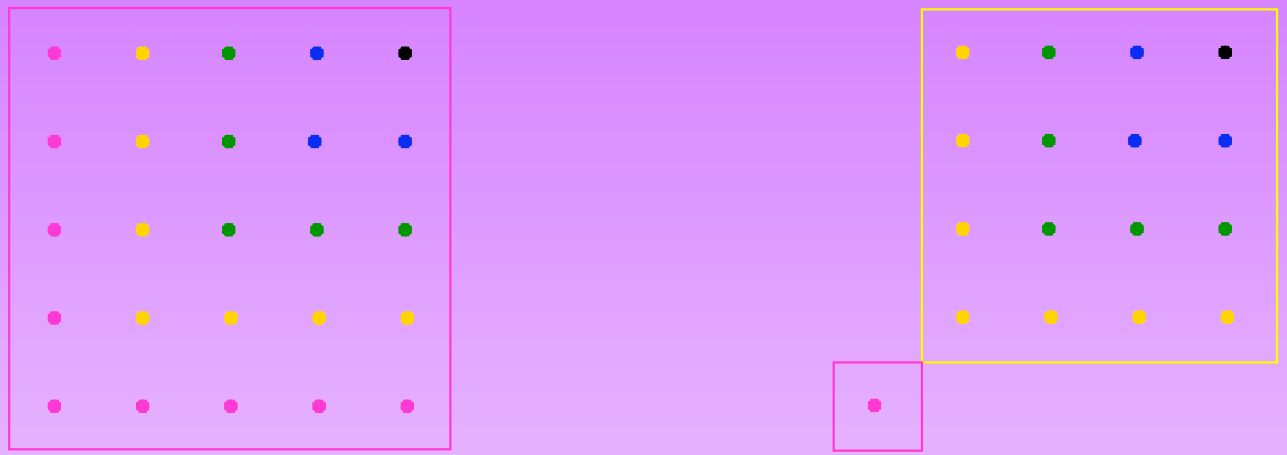
Square Numbers, continued

In each case,



Why $(n+1)^2 \neq n^2+1$, in pictures!

$(n+1)^2$ $\neq$ n^2+1



$(n+1)^2$ $=$ $n^2+2(n)+1$