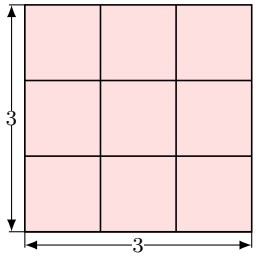
SQUARE ROOTS

A DEFINITION

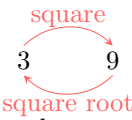
Discover:

- When we **square** a number, we multiply it by itself.
  For example, 3 squared is 3×3, which can be written as 3^2.

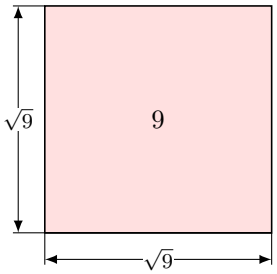


$3^2 = 9$ is the area of a square with side length 3.

- On the other hand, taking the **square root** of a number is the reverse process: it is finding a number that, when multiplied by itself, gives the original number. For example,



3 squared is 9, so the square root of 9 is 3.



The **square root** of 9, written as $\sqrt{9}$, is the side length of a square with area 9.

Definition Square root

The **square root** of a, written $\sqrt{a}$, is the **positive number** which, when squared, gives a:

$$\left(\sqrt{a}\right)^2 = \sqrt{a} \times \sqrt{a} = a$$

Ex: Find $\sqrt{25}$.

Answer: Since $5 \times 5 = 25$, $\sqrt{25} = 5$.

Definition Perfect Squares

A **perfect square** is a number that is the result of squaring an integer.

Ex: The perfect squares of the first few integers are:
1, 4, 9, 16, 25, 36, 49, 64, and so on.

B CALCULATING SQUARE ROOTS

It is easy to calculate the square root of a perfect square, but determining the square root of other numbers can be quite challenging.

Method **Use a calculator**

- Press the square root button $\boxed{\sqrt{\ }}$
- Enter the number
- Press the equals button $\boxed{=}$

Ex: Use a calculator to find $\sqrt{10}$ (round to 1 decimal place).

Answer: By entering $\sqrt{10}$ and pressing the equals button, the calculator displays: 3.16227766017.
So $\sqrt{10} \approx 3.2$.