

EXPONENTS AND SQUARE ROOTS



BASES, EXPONENTS & POWERS

In math, we have a short method of writing an expression when the same factor is repeated.

Instead of writing $3 \times 3 \times 3 \times 3 = 3^4$

BASES, EXPONENTS & POWERS

When we have 3^4

3 is the base

4 is the exponent

and

3^4 is the power

BASES, EXPONENTS & POWERS

Special names are given to exponents when they are either two or three:

7^2 can be read as seven squared

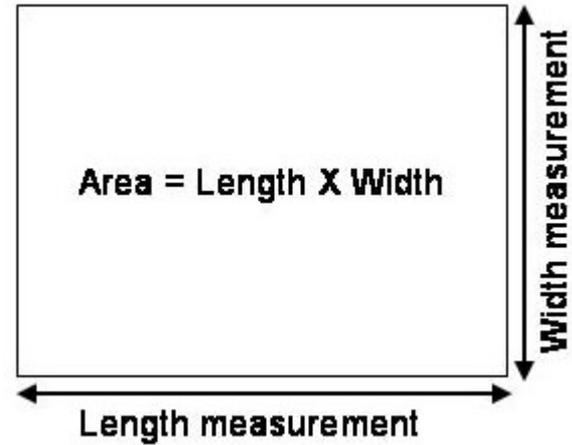
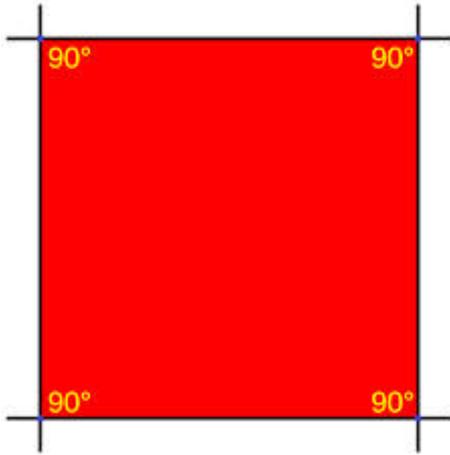
5^3 can be read as five cubed

BASES, EXPONENTS AND POWERS

Exponential Form	Word Form	Factored Form	Standard Form (Answer)
7^3	seven cubed	$7 \times 7 \times 7$	343
4^2	four squared	4×4	16
2^5	two to the fifth power	$2 \times 2 \times 2 \times 2 \times 2$	32
6^0	six to the zero power	1	1

SQUARE ROOTS

The idea of a square root comes from a 2D representation of a square



How do we find the area of a square? Side x side

Length x width

SQUARE ROOTS

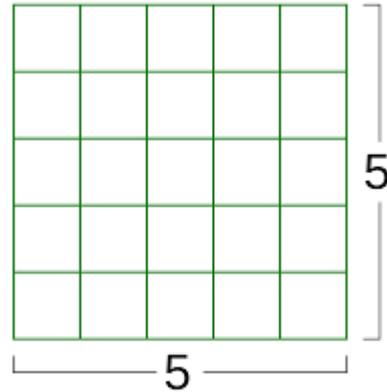
Example: Find the Area

Area = length x width

Area = 5 cm x 5 cm

Area = 5^2

Area = 25 cm²



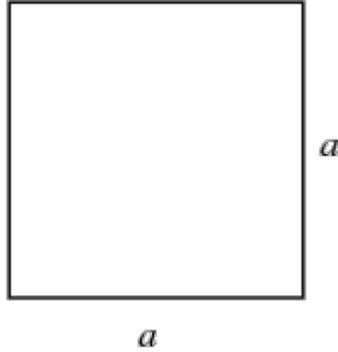
$$5 \times 5 = 25$$

$$5^2 = 25$$

SQUARE ROOTS

$$\text{Area} = a \times a$$

$$\text{Area} = a^2$$



SQUARE ROOTS

What if we were working backwards?

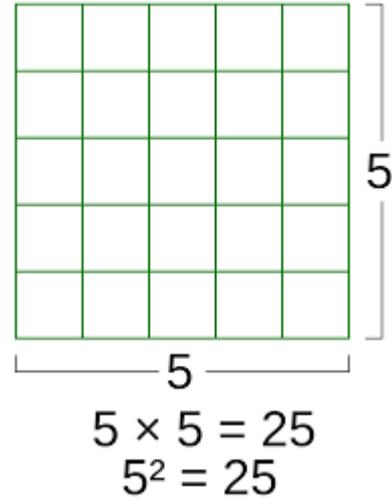
Example:

The area is 25cm^2 , find the length of each side.

We know that each side is 5.

This leads to the idea of the square root.

What is a square root? The square root of a number is a value when multiplied by itself, gives the number.



SQUARE ROOTS

Example:

$4 \times 4 = 16$, so the square root of 16 is 4.

We use this symbol:

$$\sqrt{16} = 4$$

CLASSWORK

Evaluate:

1. 2^7

2. 3^4

3. 4^5

4. 2^4

5. $\sqrt{25}$

6. $\sqrt{36}$

7. $\sqrt{49}$

8. $\sqrt{81}$