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

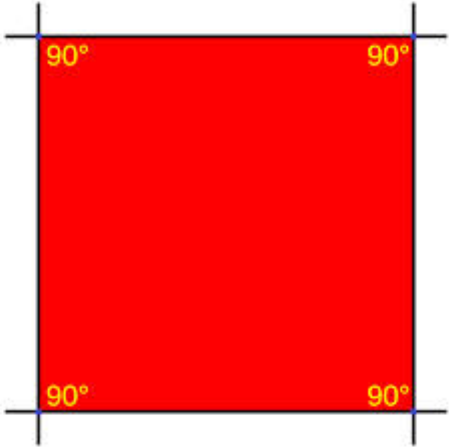
5^3 can be read as five cubed

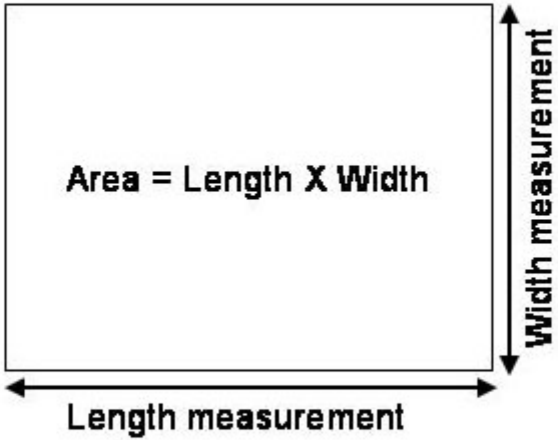
Bases, Exponents and Powers

Exponential Form	Word Form	Factored Form	Standard Form (Answer)
7^3	seven cubed	7 x 7 x 7	343
4^2	four squared	4 x 4	14
2^5	two to the fifth power	2 x 2 x 2 x 2 x 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



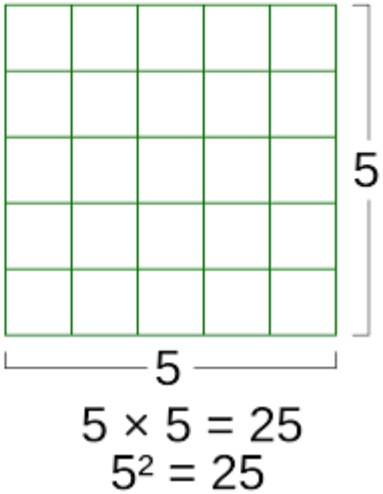


How do we find the area of a square? Side x side

Length x width

Square Roots

Example: Find the Area



Area = length x width

Area = 5 cm x 5 cm

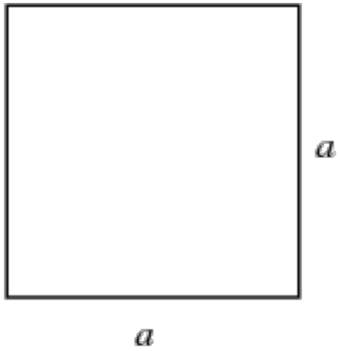
Area = 5^2

Area = 25 cm^2

Square Roots

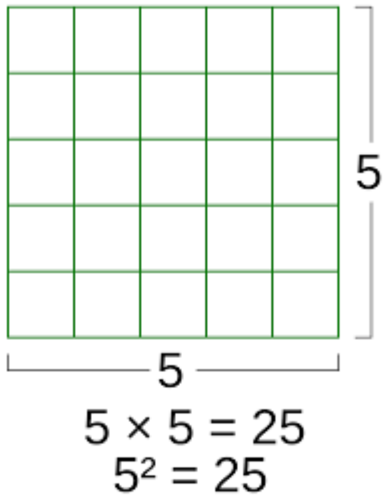
Area = a x a

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 x 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. $\sqrt{81}$