

## squares and square roots

### Squares

- How to Square A Number

To square a number, just multiply it by itself ...

- "Squared" is often written as a little 2 like this:

$$4^2 = 16$$

- This says "*4 Squared equals 16*"

(the little 2 says the number appears twice in multiplying)

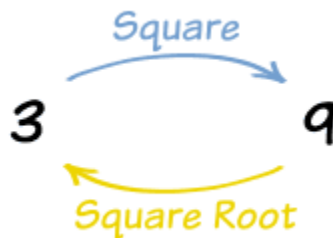
### That's interesting

- When you square a **negative** number you get a **positive** result.

$$\begin{array}{l} 5 \times 5 = 25 \\ -5 \times -5 = 25 \end{array} \left. \vphantom{\begin{array}{l} 5 \times 5 = 25 \\ -5 \times -5 = 25 \end{array}} \right\} \text{same answer!}$$

### Square roots

A **square root** goes the other way:



3 squared is 9, so a **square root of 9 is 3**

- A square root of a number is ...

... a value that can be **multiplied by itself** to give the original number.

- A square root of **9** is ...

... 3, because **when 3 is multiplied by itself** you get 9.

## Perfect squares

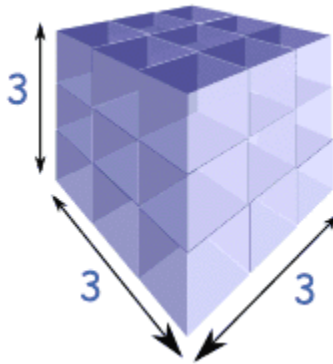
Whole numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15...
Perfect squares	1	4	9	16	25	36	49	64	81	100	121	144	169	196	225 ...

## Cube and cube roots

- How to Cube A Number

To **cube** a number, just use it in a multiplication **3 times** ...

- Example - 3 cubed



- 3 Cubed =  $3 \times 3 \times 3 = 27$

## Cube roots

- A **cube root** goes the other direction:

3 cubed is 27, so the **cube root of 27 is 3**



- The cube root of a number is ...

... a special value that when **cubed** gives the original number.

- The cube root of **27** is ...

... **3**, because **when 3 is cubed** you get **27**.

## Perfect cubes

The Perfect Cubes are the cubes of the **whole numbers**:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15...</b>
<b>1</b>	<b>8</b>	<b>27</b>	<b>64</b>	<b>125</b>	<b>216</b>	<b>343</b>	<b>512</b>	<b>729</b>	<b>1000</b>	<b>1331</b>	<b>1728</b>	<b>2197</b>	<b>2744</b>	<b>3375...</b>