

Name _____

Cube Root Method

Method for Finding the Cube of a Two-Digit Number

We will learn the short-cut method for finding the cube of a two-digit number.

Suppose, we have $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$.

METHOD:

For finding the cube of a two-digit number with the tens digit = a

and the units digit = b, we make four columns, headed by

a^3 , $(3a^2 \times b)$, $(3a \times b^2)$ and b^3

The rest of the procedure is the same as followed in squaring a number by the column method.

We simplify the working as;

$$a^2 \times a = a^3;$$

$$a^2 \times 3b = 3a^2b;$$

$$b^2 \times 3a = 3ab^2;$$

$$b^2 \times b = b^3;$$

1. Find the value of $(29)^3$ by the short-cut method.

Solution:

Here, $a = 2$ and $b = 9$.

$$a^2 \times a = a^3;$$

$$a^2 \times 3b = 3a^2 \times b;$$

$$b^2 \times 3a = 3a \times b^2;$$

$$b^2 \times b = b^3$$

Therefore, $(29)^3 = 24389$

4	4	81	81
<u>x 2</u>	<u>x 27</u>	<u>x 6</u>	<u>x 9</u>
8	108	486	729
<u>+ 16</u>	<u>+ 55</u>	<u>+ 72</u>	
<u>24</u>	<u>163</u>	<u>558</u>	

2. Find the value of $(71)^3$ by the short-cut method.

Solution:

Here, $a = 7$ and $b = 1$

$$a^2 \times a = a^3;$$

$$a^2 \times 3b = 3a^2 \times b;$$

$$b^2 \times 3a = 3a \times b^2;$$

$$b^2 \times b = b^3$$

Therefore, $(71)^3 = 357911$

49	49	1	1
<u>x 7</u>	<u>x 3</u>	<u>x 21</u>	<u>x 1</u>
343	147	21	1
<u>+ 14</u>	<u>+ 2</u>		
<u>357</u>	<u>149</u>		

By following the above examples on the method for finding the cube of a two-digit number; we can try **to find the value of each of the following using the short-cut method;**

1. $(25)^3$

2. $(47)^3$

3. $(68)^3$

4. $(84)^3$