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The calculator sequence is: 10, x^y, 3

Special Rules for Powers

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This means that the number 1 raised to any power is 1:

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$$1^5 = 1 \times 1 \times 1 \times 1 \times 1 = 1 \quad 1^6 = 1 \times 1 \times 1 \times 1 \times 1 \times 1 = 1$$

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and so on.

In fact, for any number n,

$$1^n = 1$$

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Any number raised to the first power is that number:

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Any number raised to the zero power is one:

$$3^0 = 1 \quad 4^0 = 4 \quad 10^0 = 1 \quad 8^0 = 1$$

and so on.

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The previous rules can be understood by the following consideration: Reducing the exponent by 1 divides the result by the base:

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$$3^2 = 9 = \frac{27}{3} = \frac{3^3}{3}$$

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In fact we can go further still:

$$3^{-1} = \frac{3^0}{3} = \frac{1}{3} = 0.3333333\dots$$

Negative Exponents

and

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$3 \quad x^y \quad 2 \quad +/- \quad =$

which should produce the result 0.1111111.

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To calculate 3^{-3}, the sequence is

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This is because

$$3^{-3} = \frac{1}{3^3} = \frac{1}{27}$$

Examples

Find the value of:

$$7^3$$

Examples

Find the value of:

$$7^3$$

Solution:

$$7^3 = 7 \times 7 \times 7 = 343$$

Calculator key sequence:

$7 \quad x^y \quad 3 \quad =$

Spreadsheet formula:

$$= 7\hat{\ }3$$

Examples

Find the value of:

$$10^4$$

Examples

Find the value of:

$$10^4$$

Solution:

$$10^4 = 10 \times 10 \times 10 \times 10 = 10000$$

Calculator key sequence:

$10 \quad x^y \quad 4 \quad =$

Spreadsheet formula:

$$= 10\hat{\ }4$$

Examples

Find the value of:

$$2^{10}$$

Examples

Find the value of:

$$2^{10}$$

Solution:

$$2^{10} = 1024$$

Calculator key sequence:

$2 \quad x^y \quad 10 \quad =$

Spreadsheet formula:

$$= 2\hat{\ }10$$

Examples

Find the value of:

$$3^5$$

Examples

Find the value of:

$$3^5$$

Solution:

$$3^5 = 243$$

Calculator key sequence:

$3 \quad x^y \quad 5 \quad =$

Spreadsheet formula:

$$= 3\hat{\ }5$$

Examples

Find the value of:

$$5^{-2}$$

Examples

Find the value of:

$$5^{-2}$$

Solution:

$$5^{-2} = \frac{1}{5^2} = \frac{1}{25} = 0.04$$

Calculator key sequence:

$5 \quad x^y \quad 2 \quad +/- \quad =$

Spreadsheet formula:

$$= 5\,\hat{}\,-2$$

Examples

Find the value of:

$$10^8$$

Examples

Find the value of:

$$10^8$$

Solution:

$$10^8 = 100000000 = 100,000,000$$

(one hundred million)

Calculator key sequence:

$10 \quad x^y \quad 8 \quad =$

Spreadsheet formula:

$$= 10\hat{}8$$

Examples

Find the value of:

$$10^9$$

Examples

Find the value of:

$$10^9$$

Solution:

$$10^9 = 1000000000 = 1,000,000,000$$

(one billion)

Calculator key sequence:

$10 \quad x^y \quad 9 \quad =$

Spreadsheet formula:

$$=10\hat{\ }9$$

Examples

Find the value of:

$$10^{10}$$

Examples

Find the value of:

$$10^{10}$$

Solution:

$$10^{10} = 10000000000 = 10,000,000,000$$

(ten billion)

Calculator key sequence:

$10 \quad x^y \quad 10 \quad =$ Answer displays as: $1.^{10}$

Spreadsheet formula:

$$= 10\hat{\ }10$$

Note that the calculator switched to scientific notation.