SQUARE ROOT

The square root of a number is the positive number which multiplied by itself, produces the given number.

The symbol for "square root" is $\sqrt{}$

Example: $2 \times 2 = 4$ therefore $\sqrt{4} = 2$

$3 \times 3 = 9$ therefore $\sqrt{9} = 3$

Finding a square root of a number is the opposite of squaring this number.

$\left(\sqrt{x}\right)^2 = x$ and $\sqrt{x^2} = x$

PERFECT SQUARES AND COMMON SQUARE ROOTS

Numbers such as 2^2, 3^2, 4^2, 5^2, 6^2, etc are known as perfect squares.

The first 12 square numbers are:

Index form	1^2	2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2	11^2	12^2
Basic numeral	1	4	9	16	25	36	49	64	81	100	121	144

A list of common square roots are:

Square root form	$\sqrt{1}$	$\sqrt{4}$	$\sqrt{9}$	$\sqrt{16}$	$\sqrt{25}$	$\sqrt{36}$	$\sqrt{49}$	$\sqrt{64}$	$\sqrt{81}$	$\sqrt{100}$	$\sqrt{121}$	$\sqrt{144}$
Basic numeral	1	2	3	4	5	6	7	8	9	10	11	12

CUBIC ROOT

The cubic root of a number is the positive number which multiplied by itself twice, produces the given number.

The symbol for "cubic root" is $\sqrt[3]{}$

Example: $2 \times 2 \times 2 = 8$ therefore $\sqrt[3]{8} = 2$

$3 \times 3 \times 3 = 27$ therefore $\sqrt[3]{27} = 3$

Finding a cubic root of a number is the opposite of cubing this number.

$\left(\sqrt[3]{x}\right)^3 = x$ and $\sqrt[3]{x^3} = x$

SQUARE AND CUBIC ROOTS - EXAMPLES

Evaluate:

a $3^3 - \sqrt{9} + 1^2$ **b** $\sqrt{8^2 + 6^2}$ **c** $\sqrt[3]{\frac{100 - 28}{9}}$

SOLUTION

a $3^3 - \sqrt{9} + 1^2 = 27 - 3 + 1$
$= 25$

b $\sqrt{8^2 + 6^2} = \sqrt{64 + 36}$
$= \sqrt{100}$
$= 10$

c $\sqrt[3]{\frac{100 - 28}{9}} = \sqrt[3]{\frac{72}{9}}$
$= \sqrt[3]{8}$
$= 2$

EXPLANATION

$3^3 = 3 \times 3 \times 3$, $\sqrt{9} = 3$, $1^2 = 1 \times 1$

$8^2 = 8 \times 8$, $6^2 = 6 \times 6$
$\sqrt{100} = 10$

Simplify the fraction first.