

Squares, Cubes, and Their Roots

Many students confuse the functions of squares, cubes, and their roots, and it can be difficult to recognize these numbers without memorizing them. This handout serves as a reference tool and provides a brief explanation of squares, square roots, cubes, and cube roots.

Squares

A square is a number multiplied by itself. For example, 4×4 is four squared. In math notation, with “ n ” representing any number, a number squared is written as n^2 , so four squared would be written as 4^2 . The following is a list of common perfect squares:

$$0^2 = 0$$

$$7^2 = 49$$

$$14^2 = 196$$

$$1^2 = 1$$

$$8^2 = 64$$

$$15^2 = 225$$

$$2^2 = 4$$

$$9^2 = 81$$

$$16^2 = 256$$

$$3^2 = 9$$

$$10^2 = 100$$

$$17^2 = 289$$

$$4^2 = 16$$

$$11^2 = 121$$

$$18^2 = 324$$

$$5^2 = 25$$

$$12^2 = 144$$

$$19^2 = 361$$

$$6^2 = 36$$

$$13^2 = 169$$

$$20^2 = 400$$

Square Roots

The opposite operation of squaring a number is finding its square root, and square roots are written with the radical symbol “ $\sqrt{\quad}$ ” over them. Because squaring and finding a number’s square root are opposite operations, they cancel each other out. For example, $\sqrt{25} = 5$ because $5^2 = 25$. The following is a list of common perfect square roots:

$$\sqrt{0} = 0$$

$$\sqrt{49} = 7$$

$$\sqrt{196} = 14$$

$$\sqrt{1} = 1$$

$$\sqrt{64} = 8$$

$$\sqrt{225} = 15$$

$$\sqrt{4} = 2$$

$$\sqrt{81} = 9$$

$$\sqrt{256} = 16$$

$$\sqrt{9} = 3$$

$$\sqrt{100} = 10$$

$$\sqrt{289} = 17$$

$$\sqrt{16} = 4$$

$$\sqrt{121} = 11$$

$$\sqrt{324} = 18$$

$$\sqrt{25} = 5$$

$$\sqrt{144} = 12$$

$$\sqrt{361} = 19$$

$$\sqrt{36} = 6$$

$$\sqrt{169} = 13$$

$$\sqrt{400} = 20$$

Cubes

A cube is a number multiplied by itself and then multiplied by itself again. For example, $4 \times 4 \times 4$ is four cubed. In math notation, with “n” representing any number, a number cubed is written as n^3 , so four cubed is written as 4^3 . The following is a list of common perfect cubes:

$0^3 = 0$	$7^3 = 343$	$14^3 = 2744$
$1^3 = 1$	$8^3 = 512$	$15^3 = 3375$
$2^3 = 8$	$9^3 = 729$	$16^3 = 4096$
$3^3 = 27$	$10^3 = 1000$	$17^3 = 4913$
$4^3 = 64$	$11^3 = 1331$	$18^3 = 5832$
$5^3 = 125$	$12^3 = 1728$	$19^3 = 6859$
$6^3 = 216$	$13^3 = 2197$	$20^3 = 8000$

Cube Roots

The opposite operation of cubing a number is finding the cube root, and cube roots are written with the radical symbol “ $\sqrt[3]{\quad}$ ” over them. Because cubing and finding a number’s cube root are opposite operations, they cancel each other out. For example, $\sqrt[3]{125} = 5$ because $5^3 = 125$.

The following is a list of common perfect cube roots:

$\sqrt[3]{0} = 0$	$\sqrt[3]{343} = 7$	$\sqrt[3]{2744} = 14$
$\sqrt[3]{1} = 1$	$\sqrt[3]{512} = 8$	$\sqrt[3]{3375} = 15$
$\sqrt[3]{8} = 2$	$\sqrt[3]{729} = 9$	$\sqrt[3]{4096} = 16$
$\sqrt[3]{27} = 3$	$\sqrt[3]{1000} = 10$	$\sqrt[3]{4913} = 17$
$\sqrt[3]{64} = 4$	$\sqrt[3]{1331} = 11$	$\sqrt[3]{5832} = 18$
$\sqrt[3]{125} = 5$	$\sqrt[3]{1728} = 12$	$\sqrt[3]{6859} = 19$
$\sqrt[3]{216} = 6$	$\sqrt[3]{2197} = 13$	$\sqrt[3]{8000} = 20$