GERMANNA
ACADEMIC CENTER
FOR EXCELLENCE

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, 4x4 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 "$\sqrt{\ }$" 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, 4x4x4 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 "$\sqrt[3]{}$" 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:

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