Cube Roots

When working with **cube roots**, you will also use a radical sign. The radical sign will have a superscript 3 in front of it, $\sqrt[3]{}$. The 3 in this case is called the **index.** $\sqrt[3]{a}$ is read "the cube root of a." **Perfect cubes** have cube roots that are integers. The **cube root** of a radicand is the number that, when used as a factor in multiplication three times, equals the radicand. For example, 1, 8, 27, 64, 125, and 216 are perfect cubes. Unlike the radicand of a square root, the radicand of a cube root can be negative, because it is the product of an odd number of factors (three).

Example

The number 729 is a perfect cube. $\sqrt[3]{729}$ is read "the cube root of seven hundred twenty-nine."

$\sqrt[3]{729} = 9$

$9^3 = 9 \bullet 9 \bullet 9 = 729$

Example

The number -27 is a perfect cube. $\sqrt[3]{-27}$ is read "the cube root of negative twenty-seven."

$\sqrt[3]{-27} = -3$

$(-3)^3 = (-3) \bullet (-3) \bullet (-3) = -27$

Practice

Directions: For Numbers 1 through 10, find the cube root of each number. If the radicand is not a perfect cube, give an estimate to the nearest tenth.

1. $\sqrt[3]{8}$ = ______________
2. $\sqrt[3]{64}$ = ______________
3. $\sqrt[3]{9}$ = ______________
4. $\sqrt[3]{-8}$ = ______________
5. $\sqrt[3]{20}$ = ______________
6. $\sqrt[3]{-125}$ = ______________
7. $\sqrt[3]{-1}$ = ______________
8. $\sqrt[3]{-50}$ = ______________
9. $\sqrt[3]{216}$ = ______________
10. $\sqrt[3]{16}$ = ______________