REVIEW: Cube Roots

Name _____

Key Concept and Vocabulary

A **cube root** of a number p is a number whose cube is equal to p.

A **perfect cube** is a number that can be written as the cube of an integer.

$\sqrt[3]{8} = 2$

$\sqrt[3]{-8} = -2$

Skill Examples

1. $\sqrt[3]{1000}$

∴ Because $10^3 = 1000$, $\sqrt[3]{1000} = 10$.

2. $\sqrt[3]{-64}$

∴ Because $(-4)^3 = -64$, $\sqrt[3]{-64} = -4$.

3. $\sqrt[3]{\frac{1}{8}}$

∴ Because $\left(\frac{1}{2}\right)^3 = \frac{1}{8}$, $\sqrt[3]{\frac{1}{8}} = \frac{1}{2}$.

Application Example

4. The volume of a cube-shaped container is 512 cubic inches. What is the edge length of the container?

$V = s^3$

$512 = s^3$

$\sqrt[3]{512} = \sqrt[3]{s^3}$

$8 = s$

∴ The edge length of the container is 8 inches.

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Find the cube root.

5. $\sqrt[3]{27} =$ 3

6. $\sqrt[3]{-1} =$ −1

7. $\sqrt[3]{343} =$ 7

8. $\sqrt[3]{-125} =$ −5

9. $\sqrt[3]{216} =$ 6

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

11. $\sqrt[3]{\frac{1}{27}} =$ $\frac{1}{3}$

12. $\sqrt[3]{\frac{1}{1000}} =$ $\frac{1}{10}$

13. $\sqrt[3]{\frac{1}{125}} =$ $\frac{1}{5}$

14. $\sqrt[3]{-\frac{1}{216}} =$ $-\frac{1}{6}$

15. $\sqrt[3]{\frac{8}{64}} =$ $\frac{1}{2}$

16. $\sqrt[3]{-\frac{27}{125}} =$ $-\frac{3}{5}$

Evaluate the expression.

17. $2\sqrt[3]{27} + 4 =$ 10

18. $5 - \sqrt[3]{-8} =$ 7

19. $\sqrt[3]{\frac{1}{64}} + 6 =$ $6\frac{1}{4}$

20. $4\sqrt[3]{\frac{125}{8}} - 10 =$ 0

21. $\frac{1}{3}\left(\sqrt[3]{729} - 3\right) =$ 2

22. $10\left(\frac{1}{3} + \sqrt[3]{\frac{1000}{216}}\right) =$ 20

23. ROOM The volume of a cube-shaped room is 729 cubic feet. You paint four walls of the room. How many square feet do you paint?

You paint 324 square feet.