**Cubes and Cube Roots**

A **perfect cube** has three identical integer factors.

**For example:** 8 = 2 • 2 • 2 = 23 **and** *-*8 = -2 • -2 • -2 = -23  or (-2) 3

Therefore, 2 is the **cube root** of 8 and -2 is the **cube root** of -8,

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

Identify the cube root of the following perfect cubes:

1. The cube root of 27 is \_\_\_\_ because ( )3 = \_\_\_\_\_
2. The cube root of -27 is \_\_\_\_ because ( )3 = \_\_\_\_\_
3. The cube root of 216 is \_\_\_\_ because ( )3 = \_\_\_\_\_
4. The cube root of -216 is \_\_\_\_ because ( )3 = \_\_\_\_\_
5. The cube root of 1 is \_\_\_\_ because ( )3 = \_\_\_\_\_
6. The cube root of -1 is \_\_\_\_ because ( )3 = \_\_\_\_\_
7. The cube root of -125 is \_\_\_\_ because ( )3 = \_\_\_\_\_
8. The cube root of 125 is \_\_\_\_ because ( )3 = \_\_\_\_\_
9. The cube root of -64 is \_\_\_\_ because ( )3 = \_\_\_\_\_
10. The cube root of -64 is \_\_\_\_ because ( )3 = \_\_\_\_\_

**Simplify each expression**

**1.** $\sqrt[3]{27} $+ 15 **2.** 20 − $\sqrt[3]{125}$

**3.** $\sqrt[3]{\frac{1}{64}}$ **4.** $\frac{\sqrt[3]{-216}}{3}$

**Solve the following problems involving cube roots:**

1. What is the side length of a cube that has a volume of 27 cubic centimeters? Show why your answer is correct.

Why would it be unrealistic to ask this same question for a cube with a volume of -27 cubic centimeters?

1. You have a gift box that is a perfect cube. Its volume is 8 cubic inches. How much wrapping paper do you need to cover the box? Give an explanation for your answer.

Would this gift box likely be able to hold Hershey’s kisses or a large birthday cake? Justify your answer.