

Objective #13

Cube and fourth roots

Simplify:

1. $\sqrt[3]{64}$

[A] 4

[B] 16

[C] 5

[D] 21 R 1

$$\sqrt[3]{4^3} = 4$$

$$\begin{array}{r} 2 \overline{)64} \\ \underline{2 \overline{)32}} \\ 2 \overline{)16} \\ \underline{2 \overline{)8}} \\ 2 \overline{)4} \\ \underline{2} \\ 0 \end{array} = 2^6 = (2^2)^3 = 4^3$$

2. $\sqrt[4]{81}$

$$\sqrt[4]{3^4} = 3$$

$$\begin{array}{r} 3 \overline{)81} \\ \underline{3 \overline{)27}} \\ 3 \overline{)9} \\ \underline{3} \\ 0 \end{array} = 3^4$$

3. $\sqrt[3]{-8}$

[A] 2

[B] -2

[C] 4

[D] not a real number

$$\begin{array}{r} -2 \overline{)-8} \\ \underline{-2 \overline{)4}} \\ -2 \end{array} (-2)^3$$

$$\sqrt[3]{(-2)^3} = -2$$

4. $\sqrt[3]{-216}$

$$\begin{array}{r} 2 \overline{)216} \\ \underline{2 \overline{)108}} \\ 2 \overline{)54} \\ \underline{3 \overline{)27}} \\ 3 \overline{)9} \\ \underline{3} \\ 0 \end{array} = 2^3 \cdot 3^3$$

$$-216 = -(2^3)(3^3)$$

$$\sqrt[3]{(-2)^3(3)^3} = -2(3) = -6$$