

$$\sqrt[3]{108} = \sqrt[3]{27 \times 4}$$

→ entire  
1  
8  
27  
64

↑ greatest perfect cube.

$$\sqrt[3]{27} \cdot \sqrt[3]{4} = 3\sqrt[3]{4}$$

**Example 2** Writing Radicals in Simplest Form

Write each radical in simplest form, if possible.

- a)  $\sqrt[3]{40}$     b)  $\sqrt{26}$     c)  $\sqrt[4]{32}$

**SOLUTION**

$$\sqrt[3]{40}$$

$$\sqrt{26}$$

$$\sqrt[4]{32}$$

$$\sqrt[4]{32}$$

$$\sqrt[3]{8 \cdot 5}$$

$$\sqrt[3]{8} \cdot \sqrt[3]{5}$$

$$2\sqrt[3]{5}$$

$$\sqrt[4]{16 \cdot 2}$$

$$\sqrt[4]{16} \cdot \sqrt[4]{2}$$

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



CHECK YOUR UNDERSTANDING

Express as a reduced mixed radical.

$$5\sqrt{18}$$

$$\begin{array}{r} 5 \\ \hline 28 \end{array}$$

$$5 \cdot \sqrt{9 \cdot 2}$$

$$5 \cdot \sqrt{9} \cdot \sqrt{2}$$

$$5 \cdot 3 \cdot \sqrt{2}$$

$$15\sqrt{2}$$

$$4 \sqrt[3]{54}$$

$$\begin{array}{r} 1 \\ 8 \\ 27 \\ 64 \end{array}$$

$$4 \sqrt[3]{27 \cdot 2}$$

$$4 \cdot \sqrt[3]{27} \cdot \sqrt[3]{2}$$

$$4 \cdot 3 \cdot \sqrt[3]{2}$$

$$12\sqrt[3]{2}$$

Entire Radicals  
(mixed  $\Rightarrow$  entire)

mixed	$a\sqrt[n]{b}$	$\rightarrow$	entire	$\sqrt{(a^n) \cdot b}$
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Express as an entire radical.

$2\sqrt[4]{7}$   
 $\sqrt[4]{2^4 \cdot 7}$   
 $\sqrt[4]{16 \cdot 7}$   
 $\sqrt[4]{112}$

$\sqrt{8}$   
 $\sqrt{4 \cdot 2}$   
 $\sqrt{4} \cdot \sqrt{2}$   
 $2\sqrt{2}$   
 $\sqrt{2^2 \cdot 2}$   
 $\sqrt{4 \cdot 2}$   
 $\sqrt{8}$

Express as an entire radical.

$$\begin{aligned}
 3\sqrt{5} &= \sqrt{3^2 \cdot 5} \\
 &= \sqrt{9 \cdot 5} \\
 &= \sqrt{45}
 \end{aligned}
 \qquad
 3 = \sqrt{9}$$

mixed  $\rightarrow$  entire

$$2\sqrt[3]{10} = \sqrt[3]{2^3 \cdot 10}$$

$$\sqrt[3]{8 \cdot 10}$$

$$\sqrt[3]{80}$$

entire  $\rightarrow$  mixed

$$\sqrt[3]{80} =$$

# Homework

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Questions:

11 d bf

10 a d g

12 d b F hj

11 a c e

17

18 a c

20