

4.3 Mixed and Entire Radicals

Just as with fractions, equivalent expressions for any number have the same value.

■ $\sqrt{16 \cdot 9}$ is equivalent to $\sqrt{16} \cdot \sqrt{9}$ because:

Similarly, $\sqrt[3]{8 \cdot 27}$ is equivalent to $\sqrt[3]{8} \cdot \sqrt[3]{27}$ because:

We can also use prime factorization to simplify a radical.

Example 1 Simplifying Radicals Using Prime Factorization

Simplify each radical.

a) $\sqrt{80}$

b) $\sqrt[3]{144}$

c) $\sqrt[4]{162}$



SOLUTION

Example #1A:

Simplify each radical.

a) $\sqrt{63}$

b) $\sqrt[3]{108}$

c) $\sqrt[4]{128}$



Write each radical in simplest form, if possible.

a) $\sqrt{30}$

b) $\sqrt[3]{32}$

c) $\sqrt[4]{48}$



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

Example 3**Writing Mixed Radicals as Entire Radicals**

Write each mixed radical as an entire radical.

a) $4\sqrt{3}$ b) $3\sqrt[3]{2}$ c) $2\sqrt[5]{2}$



SOLUTION