

## Exponents and Radicals Lesson #4: Entire Radicals and Mixed Radicals - Part Two

### Converting Mixed Radicals (with an index of 2) to Entire Radicals

A mixed radical of index 2 may be expressed as an entire radical. This is done by i) converting the number outside the radical symbol into a radical and then 2) multiplying it by the radicand. The number outside the radical symbol can be converted into a radical by raising it to the power of 2.

Complete the following to convert  $3\sqrt{14}$  to an entire radical.

*Mixed Radical*  $\Rightarrow$  *Entire Radical*

$$3\sqrt{14} = \sqrt{9} \times \sqrt{14}$$

$$= \sqrt{9 \times 14}$$

$$3\sqrt{14} = \sqrt{126}$$



Class Ex. #1

Convert the following mixed radicals to entire radicals.

a)  $2\sqrt{5}$

b)  $4\sqrt{7}$

c)  $10\sqrt{6}$

$$\begin{array}{c} \sqrt{100} \quad \sqrt{6} \\ \downarrow \quad \downarrow \\ \boxed{\sqrt{600}} \end{array}$$



Class Ex. #2

Convert the following mixed radicals to entire radicals.

a)  $\frac{3}{2}\sqrt{8}$

b)  $0.4\sqrt{50}$

c)  $-5\sqrt{7}$

$$\begin{array}{c} -1 \quad -5 \quad \sqrt{7} \\ \downarrow \quad \downarrow \quad \downarrow \\ - \cdot \sqrt{25} \cdot \sqrt{7} \\ \boxed{-\sqrt{175}} \end{array}$$

### Complete Assignment Questions #1 - #2

**Converting Mixed Radicals (with an index of 3 or greater) to Entire Radicals**

A mixed radical of index 3 may be expressed as an entire radical by 1) converting the number outside the radical symbol into a radical and then 2) multiplying it by the radicand. The number outside the radical symbol can be converted into a radical by raising it to the power of 3.

Complete the following to convert  $\frac{1}{2} \sqrt[3]{80}$  to an entire radical.

$$\begin{aligned}
 \text{Mixed Radical} &\Rightarrow \text{Entire Radical} \\
 \frac{1}{2} \sqrt[3]{80} &= \sqrt[3]{\quad} \times \sqrt[3]{80} \\
 &= \sqrt[3]{\quad} \times 80 \\
 \frac{1}{2} \sqrt[3]{80} &=
 \end{aligned}$$



Convert the following mixed radicals to entire radicals.

a)  $2\sqrt[4]{3}$       b)  $-4\sqrt[3]{7}$       c)  $\frac{2}{5}\sqrt[3]{100}$       d)  $-3\sqrt[4]{2}$

*Handwritten solutions:*  
 a)  $\sqrt[4]{16} \cdot \sqrt[4]{3} = \sqrt[4]{48}$   
 b)  $\sqrt[3]{-64} \cdot \sqrt[3]{7} = -\sqrt[3]{448}$  or  $\sqrt[3]{-448}$   
 c)  $\frac{2}{5}\sqrt[3]{100}$   
 d)  $-3\sqrt[4]{2}$

**Complete Assignment Questions #3 - #8**

**Extension: Radicals involving Variables (Mixed to Entire)**



Convert the following mixed radicals to entire radicals.

a)  $2\sqrt{x^3}$       b)  $a^2\sqrt{a}$       c)  $x^5\sqrt{xy}$       d)  $3xy^3\sqrt[3]{2z^4}$

*Handwritten solutions:*  
 b)  $\sqrt{a^4} \cdot \sqrt{a} = \sqrt{a^5}$   
 d)  $\sqrt[3]{27} \cdot \sqrt[3]{x^9} \cdot \sqrt[3]{y^9} \cdot \sqrt[3]{2z^4} = \sqrt[3]{54x^9y^9z^4}$

**Complete Assignment Question #9**

#1-6 (a,c,e...)