

Section 4.3: Mixed and Entire Radicals

	Entire Radical	Mixed Radical
Expressed in the form....	$\sqrt[n]{x}$	$a\sqrt[n]{x}$
Example 1	$\sqrt{24}$	$2\sqrt{6}$
Example 2	$\sqrt[3]{24}$	$2\sqrt[3]{3}$

How???

Think about this.....

$$\sqrt{36} =$$

$$\sqrt[3]{64} =$$

Multiplication Property of Radicals

$$\sqrt[n]{ab} = \sqrt[n]{a} \times \sqrt[n]{b}$$

where **n** is a natural number and **a** and **b** are real numbers

So....how is $\sqrt{24} = 2\sqrt{6}$ and $\sqrt[3]{24} = 2\sqrt[3]{3}$?

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List of Perfect Squares and Perfect Cubes

↳ necessary to simplify entire radicals into mixed radicals

Perfect Square	Square Root
1	1
4	2
9	3
16	4
25	5
36	6
49	7
64	8
81	9
100	10
121	11
144	12
169	13
196	14
225	15
256	16
289	17
324	18
361	19
400	20

Perfect Cube	Cube Root
1	1
8	2
27	3
64	4
125	5
216	6
343	7
512	8
729	9
1000	10

Simplify a Radical

↳ To simplify a square root or cube root that is not a perfect square or perfect cube, rewrite the radical using a factor that is the **largest perfect square or perfect cube**.

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Example 1 Write each radical as a mixed radical in simplest form, if possible.

a) $\sqrt{48}$

b) $\sqrt{80}$

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

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

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

f) $\sqrt{26}$

→

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Example 2 Write each mixed radical as an entire radical.

a) $5\sqrt{3}$

b) $3\sqrt[3]{2}$

c) $2\sqrt[5]{2}$

d) $-2\sqrt[3]{10}$

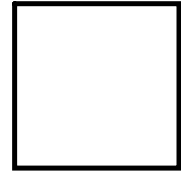
e) $-2\sqrt{5}$

→

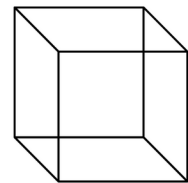
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Example 3

- a) A square has an area of 252 ft^2 . What is the side length of the square as a simplified mixed radical?



- b) What is the edge length of a cube if the volume is 200 cm^3 ? Simplify your answer as a simplified mixed radical.



Work Book Questions

p.218 #10abc, 11ag, 12ai,
16, 21

Extra Practice Questions

p.218 #4, 5, 9, 11bdfhj, 12bdfhj,
13 and 20.