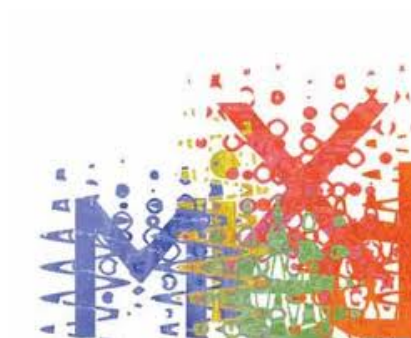




# Mixed & Entire Radicals !!

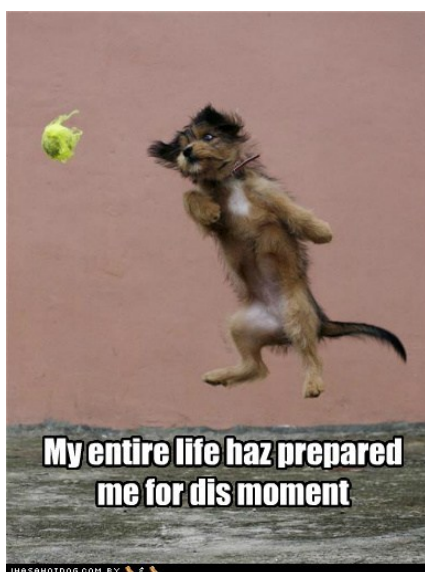
## Mixed Radical



$$2\sqrt{3}$$

A number is in front of the radical sign. “**Mixture**”

## Entire Radical



$$\sqrt{54}$$

Everything is  
**entirely** under the  
radical sign.

Calculate  $\sqrt{175}$

**What do you notice?**

**Your answer is irrational,  
therefore lets simplify!!!**



$$\sqrt{175}$$

**Use Prime Factorization !!**

# Prime Factorization

Simplify  $\sqrt{175}$

$$\sqrt{175} = \sqrt{5 \times 5 \times 7}$$

$$5\sqrt{7}$$

Simplify  $\sqrt{63}$

$$\sqrt{3 \times 3 \times 7}$$

$$\sqrt{3 \times 3 \times 7}$$

$$3\sqrt{7}$$

Simplify.

$$\sqrt[3]{1080}$$

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

$$\sqrt[3]{\underbrace{2 \times 2 \times 2}_{2^3} \times \underbrace{3 \times 3 \times 3}_{3^3} \times 5}$$

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

$$6\sqrt[3]{5}$$





$$\sqrt[3]{120}$$

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

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

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

$$2\sqrt[3]{15}$$

# Try It Yourself!!!

$$\sqrt{4}$$

**Simplify:**

a)  $\sqrt{147}$

b)  $\sqrt{80}$

c)  $\sqrt{98}$

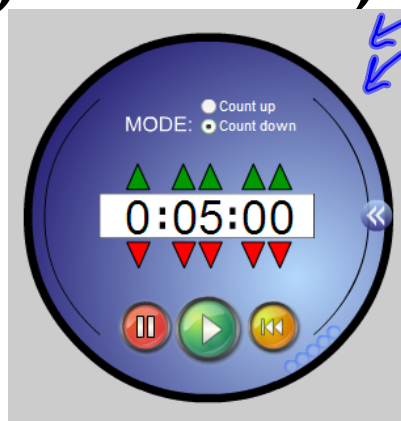
d)  $\sqrt{81}$

e)  $\sqrt{80}$

f)  $\sqrt{432}$

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

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



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

$$4 \sqrt{5}$$

a)  $\sqrt{147}$

b)  $\sqrt{80}$

c)  $\sqrt{98}$

a)  $\sqrt{3 \times 7 \times 7}$

$7\sqrt{3}$

b)  $\sqrt{2 \times 2 \times 2 \times 2 \times 5}$

$2 \times 2\sqrt{5}$

$4\sqrt{5}$

c)  $\sqrt{2 \times 7 \times 7}$

$7\sqrt{2}$

$$\text{d) } \sqrt[3]{81} \quad \text{e) } \sqrt[3]{80} \quad \text{f) } \sqrt[3]{432}$$

$$\text{d) } \sqrt[3]{\underbrace{3 \times 3 \times 3}_{\text{circled}} \times 3}$$

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

$$\text{e) } \sqrt[3]{\underbrace{2 \times 2 \times 2}_{\text{circled}} \times 2 \times 5}$$

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

$$2\sqrt[3]{10}$$

$$\text{f) } \sqrt[3]{\underbrace{2 \times 2 \times 2}_{\text{circled}} \times 2 \times \underbrace{3 \times 3 \times 3}_{\text{circled}}}$$

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

$$6\sqrt[3]{2}$$



Write  $3\sqrt{12}$  as an entire radical

$$3\sqrt{12}$$

Handwritten red annotations: a circle around the 3, an arrow pointing from the 3 to the 12, and the expression  $\sqrt{3 \cdot 3}$  written below the arrow.

$$\sqrt{12 \times 3 \times 3}$$

$$\sqrt{108}$$

Write  $2\sqrt[3]{6}$  as an entire radical

$$2\sqrt[3]{6}$$

$$\sqrt[3]{6 \times 2 \times 2 \times 2}$$

$$\sqrt[3]{48}$$

**Write  $4\sqrt[4]{3}$  as an entire radical**

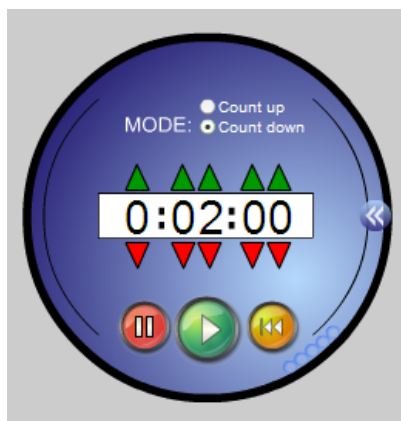
$$4\sqrt[4]{3}$$
$$\sqrt[4]{3 \times 4 \times 4 \times 4 \times 4}$$
$$\sqrt[4]{768}$$



$$4\sqrt[4]{3}$$
$$\sqrt[4]{3 \times 256}$$
$$\sqrt[4]{768}$$

# Try It Yourself!!!

a)  $6\sqrt{2}$       b)  $4\sqrt[3]{7}$       c)  $3\sqrt[4]{11}$





# Try It Yourself!!!

a)  $6\sqrt{2}$

$$\sqrt{2 \times 6 \times 6}$$

$$\sqrt{72}$$

or  $\sqrt{2 \times 36}$

$$\sqrt{72}$$

b)  $4\sqrt[3]{7}$

$$\sqrt[3]{7 \times 4 \times 4 \times 4}$$

$$\sqrt[3]{448}$$

$$\sqrt[3]{64 \times 7}$$

$$\sqrt[3]{448}$$

c)  $3\sqrt[4]{11}$

$$\sqrt[4]{11 \times 3 \times 3 \times 3 \times 3}$$

$$\sqrt[4]{891}$$

$$\sqrt[4]{11 \times 81}$$

$$\sqrt[4]{891}$$

Pg. 218

4 a, b, c, d

5 a, b, c, d

\* 7  $c^2 = a^2 + b^2$  ..... no decimals please

10 a, c, d, f, g, h

11 a, b, c, d

12 a, b, g, h

14

15

16

17a

18d

22a

Enjoy!

