Review: Square Roots/Radicals

Simplify the following radicals:

$\sqrt{36} = 6$

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

$\sqrt{20 \times 5}$
$= \sqrt{100}$
$= 10$

$\sqrt{12} \times \sqrt{3} = \sqrt{12 \cdot 3}$
$= \sqrt{36}$
$= \sqrt{6}$

Question: What does it mean to simplify a radical?

Which form do you prefer?

$\sqrt{8}$ $2\sqrt{2}$ 2.828427124...

So now the question is this: How do we get from $\sqrt{8}$ to $2\sqrt{2}$?

Review: Factoring a Single Number

What do the following numbers factor into?

8

4 2

2 2

$2 \cdot 2 \cdot 2$

30

5 2

3 5

$2 \cdot 3 \cdot 5$

75

25 3

5 5

$3 \cdot 5 \cdot 5$

Combine: Simplifying a Radical

Factor/Simplify:

$\sqrt{8}$

4 2

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

$2\sqrt{2}$

In words: The radical of a number, $\sqrt{X}$, is simplified when it is in the form $y\sqrt{Z}$, where *x, y,* and *z* are whole integers, and *z* has no repeating factors.

One More Time!: Simplifying a Radical

Factor/Simplify:

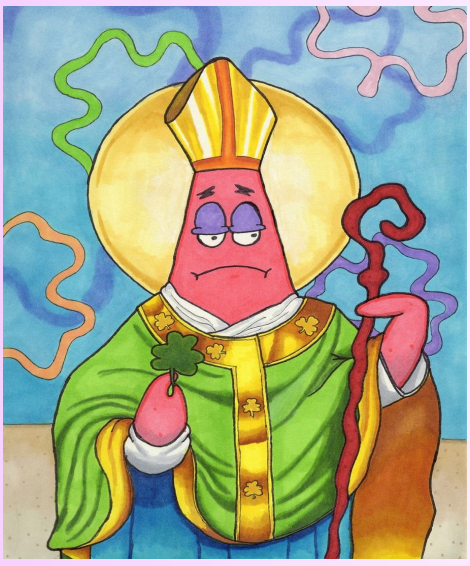
$$\sqrt{48}$$

$16 \quad 3$

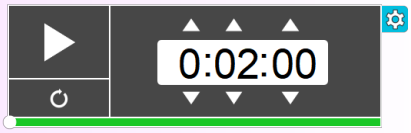
$$\sqrt{16} \cdot \sqrt{3}$$

$$4\sqrt{3}$$

Happy Saint Patrick's Day!



Warm Up Challenge!



In your groups, without using a calculator...

List as many perfect squares in ascending order, starting from 1.

I.e. 1, 4, 9, 16...

1,4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400

Your Turn!

Simplify the following radicals (whether in your groups or by yourself):

$\sqrt{14}$

Already Simplified

$\sqrt{6}$

" "

$\sqrt{225} = \sqrt{15}\sqrt{15}$

15

$\sqrt{180}$ $\sqrt{4}\cdot\sqrt{9}\cdot\sqrt{5}$

20 9 $2\cdot 3\cdot\sqrt{5}$

4 5 $\boxed{6\sqrt{5}}$

For Fun: Simplifying Non-Square Roots

Simplify the following: $\sqrt[3]{32}$

$8 \quad 4$

$\sqrt[3]{8} \cdot \sqrt[3]{4}$

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

Review Question: What can never be in the denominator of a fraction?

$$\frac{1}{y}$$

What can y never equal? 0

New Procedure: Rationalizing the denominator

How would we get rid of a radical in the denominator?

$$\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{4}} = \frac{\sqrt{2}}{2}$$

Challenge: How would we rationalize this denominator?

$$\frac{1}{1-\sqrt{2}} \cdot \frac{1+\sqrt{2}}{1+\sqrt{2}} = \frac{1+\sqrt{2}}{1-\sqrt{2}+\sqrt{2}-\sqrt{4}} = \frac{1+\sqrt{2}}{1-2} = \frac{1+\sqrt{2}}{-1}$$