Period_____ Name_____

Rationalizing Denominators

We aren't supposed to have irrational numbers in denominators. That means we aren't supposed to have square roots in denominators. So if your answer has a square root in the bottom, we have to get everything out of the square root.

When do we take numbers out of a square root? When there are two of the same. So if a square root in a denominator has a number inside it, we need to put that same number inside the radical again. We can do this by multiplying.

Simplify so that there is no radical in the denominator.

1. $\frac{\sqrt{5}}{\sqrt{7}}$
2. $\frac{3}{\sqrt{6}}$
3. $\frac{1}{\sqrt{3}}$
4. $\frac{2\sqrt{3}}{3\sqrt{5}}$
5. $\frac{3\sqrt{10}}{\sqrt{15}}$
6. $\frac{\sqrt{2}}{\sqrt{45}}$
7. $\frac{4\sqrt{10}}{3\sqrt{8}}$
8. $\sqrt{\frac{7}{8}}$
9. $\sqrt{\frac{25}{10}}$

SHOW WORK!

Square root in the bottom

$$\frac{\sqrt{3}}{\sqrt{5}}$$

5 inside

So we need another 5 inside a square root in the bottom.

$$\frac{\sqrt{3}}{\sqrt{5}\cdot\sqrt{5}}$$

...but we can't change the value of the fraction. So we multiply the top by the same thing.

$$\frac{\sqrt{3}\cdot\sqrt{5}}{\sqrt{5}\cdot\sqrt{5}} = \frac{\sqrt{15}}{5}$$

$\sqrt{3}\cdot\sqrt{5} = \sqrt{3\cdot 5} = \sqrt{15}$

$\sqrt{5}\cdot\sqrt{5} = \sqrt{5\cdot 5} = 5$

So $\frac{\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{15}}{5}$

Remember: When you multiply two square roots, you multiply the things inside the square roots.

Ex. 1 $\frac{2\sqrt{5}}{5\sqrt{2}} = \frac{2\sqrt{5}}{5\sqrt{2}}\frac{\cdot\sqrt{2}}{\cdot\sqrt{2}} = \frac{2\sqrt{5\cdot 2}}{5\cdot 2} = \frac{2\sqrt{10}}{10} = \frac{\sqrt{10}}{5}$

Remember: You can reduce fractions with the *outside* numbers.

Ex. 2 $\frac{3}{\sqrt{20}} = \frac{3}{\sqrt{2\cdot 2\cdot 5}} = \frac{3}{2\sqrt{5}}\frac{\cdot\sqrt{5}}{\cdot\sqrt{5}} = \frac{3\sqrt{5}}{2\cdot 5} = \frac{3\sqrt{5}}{10}$

Reduce any radicals that you can at the beginning.

Ex. 3 $\sqrt{\frac{10}{3}} = \frac{\sqrt{10}}{\sqrt{3}}\frac{\cdot\sqrt{3}}{\cdot\sqrt{3}} = \frac{\sqrt{30}}{3}$

The square root of a fraction is just a fraction with square roots.

1	2	3
4	5	6
7	8	9