

Take out a sheet of paper and answer the following:

Lesson 5.9- SWBAT rationalize the denominator with a monomial.

Kickoff- Perform the indicated operations:

1) $(-2\sqrt{45} + 3\sqrt{20}) - 2\sqrt{6}$
 $\sqrt{9 \cdot 5} \quad \sqrt{4 \cdot 5}$
 $\rightarrow -2 \cdot 3\sqrt{5} \quad 3 \cdot 2\sqrt{5}$
 $-6\sqrt{5} + 6\sqrt{5} - 2\sqrt{6}$
 $\sqrt{36} = 6$
 $\sqrt{25} = 5$
 $4 - 2\sqrt{5} + 2\sqrt{5} - \sqrt{5}$
 $4 - 5 = -1$

3) $\sqrt{40} \div \sqrt{10} = \sqrt{4} = 2$

4) $\frac{9\sqrt{72} + 18\sqrt{144}}{3\sqrt{2}}$
 $3\sqrt{36} \quad 6\sqrt{72}$
 $3 \cdot 6 \quad \sqrt{36} \cdot \sqrt{2}$
 $18 \quad 6 \cdot 6\sqrt{2}$
 $18 + 36\sqrt{2}$

Examples of Rationalizing the Denominator:

$\frac{3}{\sqrt{2}}$ the $\sqrt{2}$ can not be simplified so we must rationalize. There is an irrational number in the denominator that we have to make rational by turning it into a perfect square.

Steps:

- 1) Multiply the numerator and denominator by the radical in the denominator.
- 2) Simplify the radicals!
- 3) Reduce the numbers on the outside (divide!)

$\frac{3}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$

$\frac{3\sqrt{2}}{\sqrt{4}} = \frac{3\sqrt{2}}{2}$

$\frac{3 \cdot \sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{\sqrt{4}} = \frac{3\sqrt{2}}{2}$

Examples:

1) $\sqrt{\frac{25}{72}} = \frac{\sqrt{25}}{\sqrt{72}} = \frac{5}{\sqrt{72}}$
 $\frac{5}{\sqrt{72}} \cdot \frac{\sqrt{72}}{\sqrt{72}} = \frac{5\sqrt{72}}{72}$
 $\frac{30\sqrt{2}}{72} = \frac{5\sqrt{2}}{12}$
 $\sqrt{36} \cdot \sqrt{2}$
 $5 \cdot 6\sqrt{2}$
 $30\sqrt{2}$

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

2) $\frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \sqrt{3}$

3) $\frac{4}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{4\sqrt{5}}{5}$

$\frac{4\sqrt{5}}{5}$

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

4) $\frac{\sqrt{2}}{2\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{6}}{2 \cdot 3}$

$\frac{\sqrt{6}}{6} = \frac{\sqrt{6}}{2 \cdot 3}$

6) $\frac{\sqrt{6}}{\sqrt{27}} \cdot \frac{\sqrt{27}}{\sqrt{27}} = \frac{\sqrt{162}}{27}$

$\frac{162}{27\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{9\sqrt{2}}{27} = \frac{\sqrt{2}}{3}$

11) $\frac{3}{2\sqrt{3}}$

12) $\frac{\sqrt{3x^2}}{4\sqrt{5x}}$

13) $\frac{\sqrt{15}}{5\sqrt{20}}$

14) $\frac{\sqrt{24}}{\sqrt{6}}$