Lesson 5.7- SWBAT multiply and divide radicals.

Kickoff

Simplify each of the following:

1) $\sqrt{48x^4y^7}$

$\sqrt{16x^4y^6}\sqrt{3y}$

$4x^2y^3\sqrt{3y}$

2) $\sqrt{36x^8}$

$6x^4$

3) $\sqrt{80}$

$\sqrt{16}\sqrt{5}$

$4\sqrt{5}$

4) $\sqrt{175}$

HW

Multiplying Radicals:
1) Multiply the coefficients
2) Multiply the radicands
3) Express answer in simplest form.

Examples:

1) $3\sqrt{3}(-4\sqrt{6})$

$-12\sqrt{18}$

$\sqrt{9}\cdot\sqrt{2}$

$-12\cdot3\sqrt{2} =$ $\boxed{-36\sqrt{2}}$

3) $-\sqrt{10}(2\sqrt{2}+5\sqrt{5})$

$-2\sqrt{20}$ $-5\sqrt{50}$

$\sqrt{4}\cdot\sqrt{5}$ $\sqrt{25}\cdot\sqrt{2}$

$-2\cdot2\sqrt{5}$ $-5\cdot5\sqrt{2}$

$\boxed{-4\sqrt{5}\quad-25\sqrt{2}}$

2) $2\sqrt{5}(-\sqrt{2}+3\sqrt{8})$

$-2\sqrt{10}+6\sqrt{40}$

$\sqrt{4}\cdot\sqrt{10}$

$6\cdot2\sqrt{10}$

$-2\sqrt{10}+12\sqrt{10} =$ $\boxed{10\sqrt{10}}$

4) $4\sqrt{3}-2\sqrt{6}$

$-8\sqrt{18}$

$\sqrt{9}\cdot\sqrt{2}$

$-8\cdot3\sqrt{2}$

$-24\sqrt{2}$

Double Distributing!!

5) $(5+\sqrt{6})(3+\sqrt{6})$

$15+5\sqrt{6}+3\sqrt{6}+\sqrt{36}$

$15+5\sqrt{6}+3\sqrt{6}+6$

$21+8\sqrt{6}$

6) $(1+\sqrt{5})(3-\sqrt{5})$

	1	$\sqrt{5}$
3	3	$3\sqrt{5}$
$-\sqrt{5}$	$-\sqrt{5}$	$-\sqrt{25}$

$3+3\sqrt{5}-\sqrt{5}-\sqrt{25}$

$3+3\sqrt{5}-\sqrt{5}-5$

$-2+2\sqrt{5}$

Dividing Radicals:
1) Divide the coefficients
2) Divide the radicands
3) Express answer in simplest form.

Examples:

7) $\sqrt{30}\div\sqrt{6}$

$\sqrt{5}$

8) $\frac{\sqrt{48}}{6}$

$\frac{4\sqrt{3}}{6}$

$\sqrt{48}$

$\sqrt{16}\quad\sqrt{3}$

$4\sqrt{3}$

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

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9) $\frac{\sqrt{18}}{3}$

$\frac{3\sqrt{2}}{3}$ $\sqrt{18}$

$\sqrt{9}\quad\sqrt{2}$

$3\sqrt{2}$

$\sqrt{2}$

10) $\sqrt{\frac{x^{15}}{x^3}}$

$\sqrt{x^{12}}$

x^6

11) $\frac{\sqrt{108}+\sqrt{150}}{\sqrt{6}}$

$\frac{\sqrt{108}}{\sqrt{6}}+\frac{\sqrt{150}}{\sqrt{6}}$

$\sqrt{18}+\sqrt{25}$

$\sqrt{9}\quad\sqrt{2}$

$3\sqrt{2}+5$

12) $48\sqrt{54}\div12\sqrt{3}$

$4\sqrt{18}$

$\sqrt{9}\quad\sqrt{2}$

$4\cdot3\sqrt{2}$

$12\sqrt{2}$

Mixed Practice:

13) $\sqrt{3}(-5\sqrt{10} + \sqrt{6})$

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

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

16) $(2 + \sqrt{3})(2 - \sqrt{3})$