

Warm Up:
Simplify the following radical expressions.

1. $\sqrt[4]{128x^3y^7}$
 $= \sqrt[4]{2^7 \cdot 2^2 \cdot 2^2 \cdot x^3 \cdot y^7}$
 $= 2xy\sqrt[4]{8x^3y^3}$

2. $\sqrt[3]{-16a^3b^8}$
 $= -\sqrt[3]{16a^3b^8}$
 $= -2ab^2\sqrt[3]{2b^2}$

3. Are the two lines parallel, perpendicular, or neither. $y + 8 = -1/2x$ and $x - 2y = -10$
 $y + 8 = -1/2x \rightarrow y = -1/2x - 8$
 $x - 2y = -10 \rightarrow -2y = -x - 10 \rightarrow y = 1/2x + 5$
 Neither

4. Find the slope of $(-3, 5)$ and $(-3, 1)$.
 $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 5}{-3 - (-3)} = \frac{-4}{0}$ (undef)
 vert. line

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6) $4x\sqrt{512x^3y^2z^4}$

$4x\sqrt{2^9 \cdot 2^2 \cdot x^3 \cdot y^2 \cdot z^4}$
 $4x \cdot 2^2 \cdot 2 \cdot x \cdot y \cdot z^2$
 $64x^2z^2\sqrt{2xy}$

Prime factorization tree for 512:
 $512 \rightarrow 2 \cdot 256 \rightarrow 2 \cdot 128 \rightarrow 2 \cdot 64 \rightarrow 2 \cdot 32 \rightarrow 2 \cdot 16 \rightarrow 2 \cdot 8 \rightarrow 2 \cdot 4 \rightarrow 2 \cdot 2$

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Operations with Radicals
Part 1

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Adding and Subtracting: Only combine terms with "like radicands"
 **Make sure to reduce first!

Examples:

1) $-3\sqrt{5} + 2\sqrt{5}$
 $= -1\sqrt{5}$
 $= -\sqrt{5}$

2) $-3\sqrt{12} + 3\sqrt{3} + 3\sqrt{20}$
 $= -3\sqrt{2 \cdot 2 \cdot 3} + 3\sqrt{3} + 3\sqrt{2 \cdot 2 \cdot 5}$
 $= -6\sqrt{3} + 3\sqrt{3} + 6\sqrt{5}$
 $= -3\sqrt{3} + 6\sqrt{5}$

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More Adding and Subtracting:

Examples:

3) $-\sqrt{12} + 3\sqrt{3}$
 $= -2\sqrt{3} + 3\sqrt{3}$
 $= 1\sqrt{3}$
 $= \sqrt{3}$

4)

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4) $-3\sqrt{18} + 3\sqrt{8} - \sqrt{24}$
 $= -9\sqrt{2} + 6\sqrt{2} - 2\sqrt{6}$
 $= -3\sqrt{2} - 2\sqrt{6}$

$\sqrt{24} = \sqrt{2 \cdot 2 \cdot 2 \cdot 3} = 2\sqrt{6}$

$3\sqrt{8} = 3\sqrt{2 \cdot 2 \cdot 2} = 3 \cdot 2 = 6\sqrt{2}$

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You Try!!

5) $3\sqrt{18} + 3\sqrt{12} + 2\sqrt{27}$
 $= 9\sqrt{2} + 6\sqrt{3} + 6\sqrt{3}$
 $= 9\sqrt{2} + 12\sqrt{3}$

$3\sqrt{18}$
 $= 3\sqrt{2 \cdot 3 \cdot 3}$
 $= 9\sqrt{2}$

$3\sqrt{12}$
 $= 3\sqrt{2 \cdot 2 \cdot 3}$
 $= 6\sqrt{3}$

$2\sqrt{27}$
 $= 2\sqrt{3 \cdot 3 \cdot 3}$
 $= 6\sqrt{3}$

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#17 Homework

$-\sqrt[3]{320} - 4\sqrt{5} + 2\sqrt{135} + 2\sqrt{16}$
 $-4\sqrt{5} - 4\sqrt{5} + 6\sqrt{5} + 4\sqrt{2}$
 $-2\sqrt{5} + 4\sqrt{2}$

$\sqrt{8} = \sqrt{2(4)} = 2\sqrt{2}$
 $\sqrt{18} = \sqrt{2(9)} = 3\sqrt{2}$

$\sqrt[3]{108}$
 $= \sqrt[3]{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3}$
 $= 3\sqrt[3]{4}$

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#4 HW

$\sqrt[3]{900}$

$= 3\sqrt[3]{3 \cdot 3 \cdot 2 \cdot 2 \cdot 5 \cdot 5}$

$= 90$

$30 \times 30 = 900$

$30^3 = 27000$

900
 ↙ ↘
 9 100
 ↙ ↘ ↙ ↘
 3 3 10 10
 ↙ ↘ ↙ ↘ ↙ ↘
 3 3 2 2 5 5

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15 minutes on Practice problems

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Multiplying: Multiply #'s inside radicals and outside radicals separately and simplify

Examples:

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

2) $3\sqrt{3}(4 - 3\sqrt{5})$
 $= 12\sqrt{3} - 9\sqrt{15}$

Just Same Order of Radical

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More Multiplying:

Examples:

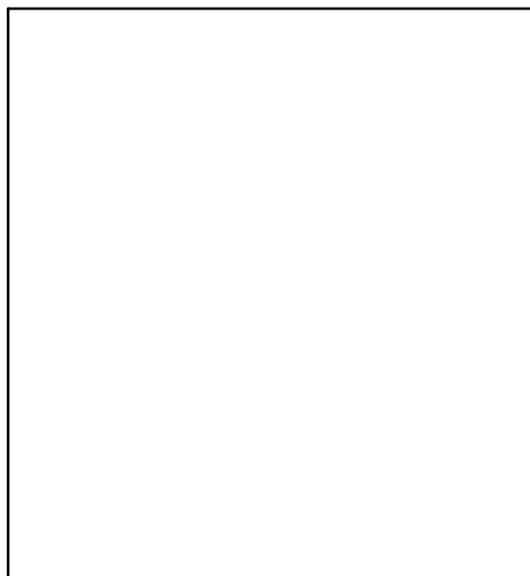
3) $(-4\sqrt{15})(-\sqrt{3})$
 $= 4\sqrt{45}$
 $= 12\sqrt{5}$

45
 ↙ ↘
 3 15
 ↙ ↘
 3 5

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$$\begin{aligned}
 4) & (5-4\sqrt{5})(-2+\sqrt{5}) \\
 & -10 + 5\sqrt{5} + 8\sqrt{5} - 4\sqrt{25} \quad (5) \\
 & -10 + 13\sqrt{5} - 20 \quad (5-4\sqrt{5})(-2+\sqrt{5}) \\
 & = -30 + 13\sqrt{5}
 \end{aligned}$$

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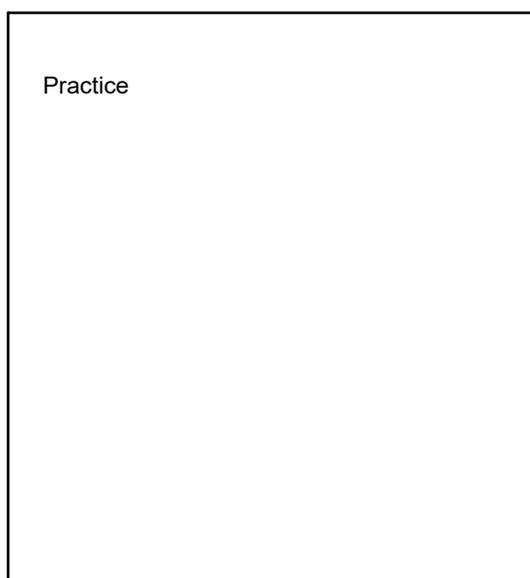


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You Try!!

$$\begin{aligned}
 5) & \sqrt{3}(-5\sqrt{10} + \sqrt{6}) \\
 & -5\sqrt{30} + \sqrt{18} \\
 & -5\sqrt{30} + \sqrt{3 \cdot 3 \cdot 2} \\
 & = -5\sqrt{30} + 3\sqrt{2}
 \end{aligned}$$

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Sep 4-6:24 PM



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