

Today's Plan:

Learning Target (standard): I will use prime factorization trees to simplify radicals. I will then add or subtract radicals.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

NAME _____

#156

BELL RINGER

1.) Solve $4^x = 16$

$$x=2$$

2.) Write the verbal phrase as an inequality.

16 time n is greater than 64

$$16n > 64$$

3.) Is the relation a function? $\{(0, 2), (1, 4), (2, 8), (3, 9)\}$

every x -value has only
one value

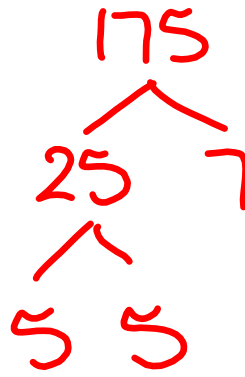
Simplify.

$$6\sqrt{175x^3y^2}$$

$$6\sqrt{5 \cdot 5 \cdot 7 \cdot x \cdot x \cdot x \cdot y \cdot y}$$

$$= 6 \cdot 5 \cdot x \cdot y \sqrt{7 \cdot x}$$

$$= 30xy\sqrt{7x}$$



Simplify.

$$5\sqrt{36a^4b^2}$$

$$5 \cdot 6 \sqrt{a \cdot a \cdot a \cdot a \cdot b \cdot b}$$

$$30 a \cdot a \cdot b$$

$$30a^2b$$

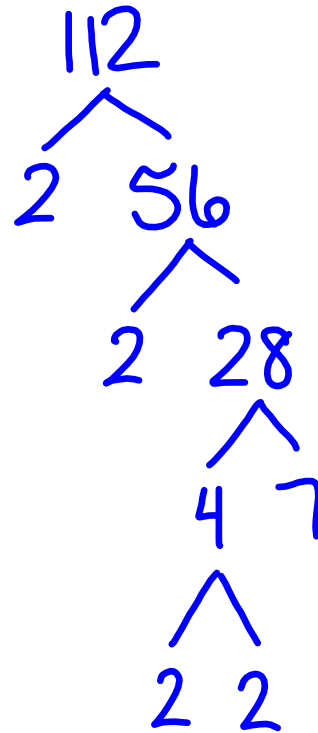
Simplify.

$$8\sqrt{112x^4y^4}$$

$$= 8\sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 7 \cdot x \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y}$$

$$= 8 \cdot 2 \cdot 2 \cdot x \cdot x \cdot y \cdot y \sqrt{7}$$

$$= 32x^2y^2\sqrt{7}$$



Simplify.

$$-3\sqrt{108x^3y^5z^4}$$

$$= -3\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3 \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y \cdot z \cdot z \cdot z \cdot z}$$

$$= -3 \cdot 2 \cdot 3 \cdot x \cdot y \cdot y \cdot z \cdot z \sqrt{3 \cdot x \cdot y}$$

$$= -18xy^2z^2\sqrt{3xy}$$



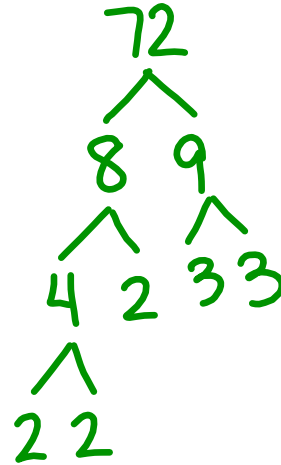
Simplify.

$$2\sqrt{72xyz^4}$$

$$= 2\sqrt{2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot x \cdot y \cdot \cancel{z \cdot z} \cdot \cancel{z \cdot z}}$$

$$= 2 \cdot 2 \cdot 3 \cdot z \cdot z \sqrt{2 \cdot x \cdot y}$$

$$= 12z^2\sqrt{2xy}$$



Adding & Subtracting Radicals:

- Simplify each radical first
- Combine like terms
 - everything under the radicals must match
 - everything outside of the radical except the coefficients must match

Addition & Subtraction of Radicals:

$$\begin{aligned}
 & \boxed{-5\sqrt{45}} + \boxed{5\sqrt{40}} \\
 & = -5\sqrt{3 \cdot 3 \cdot 5} + 5\sqrt{2 \cdot 2 \cdot 2 \cdot 5} \\
 & = -5 \cdot 3\sqrt{5} + 5 \cdot 2\sqrt{2 \cdot 5} \\
 & = -15\sqrt{5} + 10\sqrt{10}
 \end{aligned}$$

Prime factorization trees for 45 and 40:

 45: $45 \rightarrow 9 \cdot 5 \rightarrow 3 \cdot 3 \cdot 5$

 40: $40 \rightarrow 4 \cdot 10 \rightarrow 2 \cdot 2 \cdot 2 \cdot 5$

Addition & Subtraction of Radicals:

$$\begin{aligned}
 & \boxed{5\sqrt{8}} - \boxed{5\sqrt{32}} \\
 & = 5\sqrt{2 \cdot 2 \cdot 2} - 5\sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} \\
 & = 5 \cdot 2\sqrt{2} - 5 \cdot 2 \cdot 2\sqrt{2} \\
 & = 10\sqrt{2} - 20\sqrt{2} \\
 & = -10\sqrt{2}
 \end{aligned}$$

Prime factorization trees for 8 and 32:

 8: $8 \rightarrow 2 \cdot 4 \rightarrow 2 \cdot 2 \cdot 2$

 32: $32 \rightarrow 4 \cdot 8 \rightarrow 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

Simplify.

$$\begin{aligned}
 & \boxed{4\sqrt{48}} - 6\sqrt{75} - 2\sqrt{108} \\
 & = 4\sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 3} - 6\sqrt{3 \cdot 5 \cdot 5} - 2\sqrt{2 \cdot 2 \cdot 3 \cdot 3 \cdot 3} \\
 & = 4 \cdot 2 \cdot 2 \sqrt{3} - 6 \cdot 5 \sqrt{3} - 2 \cdot 2 \cdot 3 \sqrt{3} \\
 & = 16\sqrt{3} - 30\sqrt{3} - 12\sqrt{3} \\
 & = -26\sqrt{3}
 \end{aligned}$$

Addition & Subtraction of Radicals:

$$\begin{aligned}
 & -5\sqrt{45} + 5\sqrt{40} + 5\sqrt{5} - \sqrt{75} \\
 & = -5\sqrt{3 \cdot 3 \cdot 5} + 5\sqrt{2 \cdot 2 \cdot 2 \cdot 5} - \sqrt{3 \cdot 5 \cdot 5} \\
 & = -5 \cdot 3 \sqrt{5} + 5 \cdot 2 \sqrt{2 \cdot 5} - 5\sqrt{3} \\
 & = \underline{-15\sqrt{5}} + 10\sqrt{10} + \underline{5\sqrt{5}} - 5\sqrt{3} \\
 & = -10\sqrt{5} + 10\sqrt{10} - 5\sqrt{3}
 \end{aligned}$$

Assignment:

Addition & Subtraction of Radicals

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