

3rd hour

Simplify each. Assume that all variables are positive.

$$1. \sqrt{63g^4h^7} \cdot \sqrt{15g^6h^4} = \sqrt{945g^{10}h^{11}}$$

$\sqrt{63g^4h^7}$ has factors $9 \cdot 7$ and $3 \cdot 5$.
 $\sqrt{15g^6h^4}$ has factors $105 \cdot 9$.
 The final simplified expression is $3g^5h^5\sqrt{105h}$.

$$2. \sqrt[3]{49m^5n^{-13}} \cdot \sqrt[3]{21m^7n^4}$$

$\sqrt[3]{49m^5n^{-13}}$ has factors $7 \cdot 7$ and $7 \cdot 3$.
 $\sqrt[3]{21m^7n^4}$ has factors $3 \cdot 7$ and $7 \cdot 3$.
 The final simplified expression is $\frac{m^4 \sqrt[3]{3}}{n^3}$.

$$3. \sqrt[4]{12c^4d} \cdot \sqrt[5]{14c^7d^3} \cdot \sqrt[5]{20c^2d^8}$$

$\sqrt[4]{12c^4d}$ has factors $4 \cdot 3$ and $2 \cdot 2 \cdot 3$.
 $\sqrt[5]{14c^7d^3}$ has factors 1 and $2 \cdot 7$.
 $\sqrt[5]{20c^2d^8}$ has factors $4 \cdot 5$ and $2 \cdot 2 \cdot 5$.
 The final simplified expression is $2c^2d^2\sqrt[5]{105c^3d^2}$.

$$2c^2d^2\sqrt[5]{105c^3d^2}$$

Dividing radical expressions:

If $\sqrt[n]{a}$ and $\sqrt[n]{b}$ are real #'s and $b \neq 0$,

$$\text{then } \frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$$

The reverse is also true:

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}} \text{ if } a \text{ and } b \text{ are positive}$$

Simplify each. Assume that all variables are positive.

$$1. \quad \frac{\sqrt{24x^5y^{13}}}{\sqrt{3xy^4}} = \sqrt{\frac{24x^5y^{13}}{3xy^4}} = \sqrt{\frac{8x^4y^9}{1}} = \boxed{2x^2y^4\sqrt{2y}}$$

$$2. \quad \sqrt{\frac{50a^5b^4}{9a^4b^{12}}} = \sqrt{\frac{50a}{9b^8}} = \frac{\sqrt{50a}}{\sqrt{9b^8}} = \boxed{\frac{5\sqrt{2a}}{3b^4}}$$

Simplify each. Assume that all variables are positive.

$$3. \quad \frac{\sqrt{48x^9y^8}}{\sqrt{2x^6y^3}} = \sqrt{\frac{48x^9y^8}{2x^6y^3}} = \sqrt{24x^3y^5} = \boxed{2xy^2\sqrt{6xy}}$$

$$4. \quad \frac{\sqrt[3]{2x^{16}y^5}}{\sqrt[3]{54x^3y^{11}}} = \sqrt[3]{\frac{2x^{16}y^5}{27y^{11}}} = \sqrt[3]{\frac{x^{13}}{27y^6}} = \boxed{\frac{x^4}{3y^2}\sqrt[3]{x}}$$