

- 1 9
- 2 3
- 0 5

$$x^2 \cdot x^3 = x^{2+3} = x^5$$

1/8 Simplifying $\sqrt{\quad}$'s Day II

I. Simplifying variables: exponents must **ADD** to the exponent in the radicand

\sqrt{x}	$\sqrt{x^2}$	$\sqrt{x^3}$	$\sqrt{x^4}$	$\sqrt{x^5}$	$\sqrt{x^6}$	$\sqrt{x^7}$	$\sqrt{x^8}$	$\sqrt{x^9}$	$\sqrt{x^{10}}$
\downarrow	\downarrow	$\sqrt{x^2} \cdot \sqrt{x}$	\downarrow	$\sqrt{x^4} \cdot \sqrt{x}$	\downarrow	$\sqrt{x^6} \cdot \sqrt{x}$	\downarrow	$\sqrt{x^8} \cdot \sqrt{x}$	\downarrow
\sqrt{x}	x	$x\sqrt{x}$	x^2	$x^2\sqrt{x}$	x^3	$x^3\sqrt{x}$	x^4	$x^4\sqrt{x}$	x^5

can't

simplify any for the

Even Exponents: take $\frac{1}{2}$ of the exponent in the radicand
B/c $\sqrt{x} = x^{\frac{1}{2}}$

ODD Exponents: 2nd $\sqrt{\quad}$ will always be \sqrt{x} , then take the difference of the exponents to get the 1st $\sqrt{\quad}$

II. Steps

- 1) Split up the # and variable, placing each one under its own $\sqrt{\quad}$
- 2) Simplify each $\sqrt{\quad}$ separately following the correct rules
- 3) multiply the terms w/o the $\sqrt{\quad}$'s together and then multiply the terms under the $\sqrt{\quad}$ together.
- 4) write your final answer as # $\sqrt{\quad}$

III. Ex's: Simplify

$$\begin{aligned} \textcircled{1} \sqrt{24x^2} &= \sqrt{24} \cdot \sqrt{x^2} \\ &= \sqrt{4} \cdot \sqrt{6} \cdot x \\ &= 2\sqrt{6} \cdot x \\ &= 2x\sqrt{6} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \sqrt{75x^5} &= \sqrt{75} \cdot \sqrt{x^5} \\ &= \sqrt{25} \cdot \sqrt{3} \cdot \sqrt{x^4} \cdot \sqrt{x} \\ &= 5 \cdot \sqrt{3} \cdot x^2 \cdot \sqrt{x} \\ &= 5x^2\sqrt{3x} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \sqrt[3]{25x^7} &= \sqrt[3]{25} \cdot \sqrt[3]{x^7} \\ &= \sqrt[3]{5 \cdot 5} \cdot \sqrt[3]{x^6 \cdot x} \\ &= \sqrt[3]{5} \cdot \sqrt[3]{5} \cdot x^2 \cdot \sqrt[3]{x} \\ &= 5 \cdot x^2 \cdot \sqrt[3]{x} \\ &= 5x^2\sqrt[3]{x} \end{aligned}$$

$$* \textcircled{4} \sqrt{80 x^5 y^6 z}$$

$$\sqrt{80} \cdot \sqrt{x^5} \cdot \sqrt{y^6} \cdot \sqrt{z}$$

$$\sqrt{16} \cdot \sqrt{5} \cdot \sqrt{x^4} \sqrt{x} \cdot y^3 \cdot \sqrt{z}$$

$$4 \sqrt{5} \cdot x^2 \sqrt{x} \cdot y^3 \cdot \sqrt{z}$$

$$\boxed{4x^2 y^3 \sqrt{5xz}}$$

$$** \textcircled{5} \frac{1}{2} \sqrt{500 t^4 x^3 h^8 y^9}$$

$$\frac{1}{2} \cdot \sqrt{500} \cdot \sqrt{t^4} \cdot \sqrt{x^3} \cdot \sqrt{h^8} \cdot \sqrt{y^9}$$

$$\frac{1}{2} \cdot \sqrt{100} \cdot \sqrt{5} \cdot t^2 \cdot \sqrt{x^2} \cdot \sqrt{x} \cdot h^4 \cdot \sqrt{y^4} \cdot \sqrt{y}$$

$$\frac{1}{2} \cdot 10 \sqrt{5} \cdot t^2 \cdot x \sqrt{x} \cdot h^4 \cdot y^2 \sqrt{y}$$

$$5t^2 x h^4 y^2 \sqrt{5xy}$$