

Unit 3: Rational Exponents and Radicals Video Notes Sheet

Please follow along with the video on my website and complete the following notes.

$\sqrt{\quad}$ → This symbol is called a radical. Not a square root symbol.

Label the radicand, radical, and index as done in the video for this cube root: $\sqrt[3]{8}$

The word "rational" means fraction.

Ex.) Write $4^{1/2}$ in radical form: $\sqrt{4}$. What does this simplify to? 2

What is the index? 2 What is the exponent? 1

Ex.) Write $\sqrt[3]{x^3}$ in rational exponent form: $x^{3/3}$

What is the index? 3 What is the exponent? 3

Ex.) Write $8x^{2/3}$ in radical form: $\sqrt[3]{8x^2}$

• Why is the 8 not supposed to be under the radical?
power belongs to x only, exponents before multiplication

Ex.) Simplify $x^{1/4} \cdot x^{2/3}$ $x^{11/12}$

in order of opps.

Complete the following practice problems and turn in!

Write each expression in radical form.

1) $7^{1/2}$ $\sqrt{7}$

2) $4^{3/4}$ $\sqrt[4]{4^3}$ or $(\sqrt[4]{4})^3$

3) $2^{5/3}$ $\sqrt[3]{2^5}$ or $(\sqrt[3]{2})^5$

4) $7^{4/3}$ $\sqrt[3]{7^4}$ or $(\sqrt[3]{7})^4$

5) $6^{3/2}$ $\sqrt{6^3}$ or $(\sqrt{6})^3$

6) $2^{1/6}$ $\sqrt[6]{2}$

Write each expression in exponential form.

7) $(\sqrt{10})^3$ $10^{3/2}$

8) $\sqrt[5]{2}$ $2^{1/5}$

9) $(\sqrt[4]{2})^5$ $2^{5/4}$

10) $(\sqrt[5]{3})^4$ $3^{4/5}$

11) $\sqrt{2}$ $2^{1/2}$

12) $\sqrt[6]{10}$ $10^{1/6}$

neg exp more than 1 as denom.

Write each expression in radical form.

13) $(5x)^{-5/4}$ $\frac{1}{(\sqrt[4]{5x})^5}$ or $\frac{1}{\sqrt[4]{(5x)^5}}$

14) $(5x)^{-1/2}$ $\frac{1}{\sqrt{5x}}$

15) $(10n)^{3/2}$ $(\sqrt{10n})^3$ or $\sqrt{(10n)^3}$

16) $a^{6/5}$ $\sqrt[5]{a^6}$ or $(\sqrt[5]{a})^6$