

Section P.2 Exponents and Radicals

Objective: In this lesson you learned how to use properties of exponents and radicals to simplify and evaluate expressions.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Exponential form

Scientific notation

Principal n th root

Rational exponent

I. Exponents (Pages 12–13)

In general, if b is a real number and r is a positive integer, then

$b^r = \underbrace{b \cdot b \cdot b \cdots b}_r$, where r is the _____ and b is the _____.

Complete the following properties of exponents.

$$(ab)^m = \underline{\hspace{2cm}} \qquad a^{m+n} = \underline{\hspace{2cm}}$$

$$\frac{1}{a^n} = \underline{\hspace{2cm}} \qquad |a^2| = \underline{\hspace{2cm}}$$

$$\frac{a^m}{a^n} = \underline{\hspace{2cm}} \qquad a^{mn} = \underline{\hspace{2cm}}$$

$$a^0 = \underline{\hspace{2cm}} \qquad \left(\frac{a}{b}\right)^m = \underline{\hspace{2cm}}$$

What you should learn

How to use properties of exponents

II. Scientific Notation (Page 14)

When a number is written in scientific notation, a _____ exponent indicates that the number is between 0 and 1.

A _____ exponent indicates that the number is 10 or more.

What you should learn

How to use scientific notation to represent real numbers

- Example 1:** (a) Write 970,000 in scientific notation.
 (b) Write 8.3×10^{-4} in decimal form.

III. Radicals and Their Properties (Pages 15–16)

Let a and b be real numbers. If $a = b^2$, then b is the _____ of a . If $a = b^3$, then b is the _____ of a .

In $\sqrt[n]{a}$, the positive integer n is the _____ of the radical, and the number a is the _____.

The radical expression $\sqrt{-36}$ is not a real number because . . .

What you should learn
 How to use properties of radicals

Example 2: Simplify each radical expression.

(a) $-\sqrt{\frac{81}{16}}$ (b) $\sqrt[3]{3} \cdot \sqrt[3]{9}$

IV. Simplifying Radicals (Pages 17–18)

An expression involving radicals is in **simplest form** when the following conditions are satisfied:

- 1)
- 2)
- 3)

Radical expressions are **like radicals** if . . .

What you should learn
 How to simplify and combine radicals

Example 3: Explain how to simplify a radical.

V. Rationalizing Denominators and Numerators

(Pages 18–19)

To change a radical expression so that it is free of radicals in the denominator is called _____.

The **conjugate** of the radical expression $a + b\sqrt{m}$ is _____.

What type of rationalizing factor should be used if a denominator is of the form:

(a) \sqrt{m} ? _____

(b) $\sqrt[3]{m}$? _____

Example 4: Explain how to rationalize the denominator of the expression $\frac{4 + \sqrt{13}}{5 - \sqrt{8}}$.

What you should learn

How to rationalize denominators and numerators

VI. Rational Exponents (Pages 19–20)

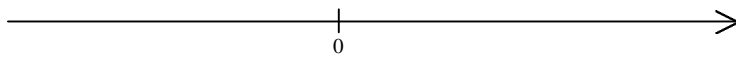
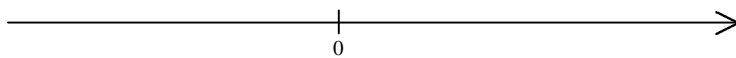
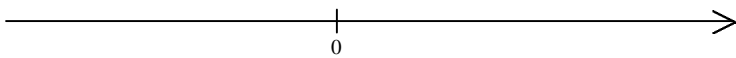
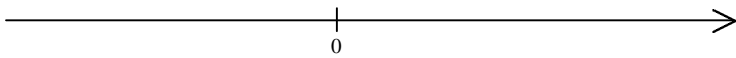
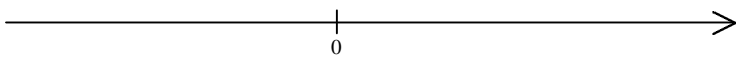
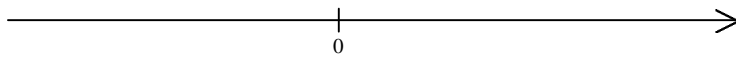
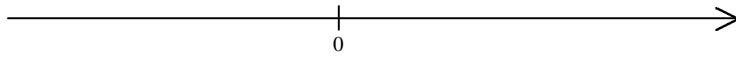
The numerator of a rational exponent denotes the _____ to which the base is raised, and the denominator denotes the _____ or the _____ to be taken.

Example 5: Write the radical expression $\sqrt[4]{w^9}$ in exponential form.

Example 6: Explain how to simplify the expression $\frac{x^{3/4}}{x^{2/3}}$.

What you should learn

How to use properties of rational exponents

Additional notes**Homework Assignment**

Page(s)

Exercises