Course Number

Instructor

Date

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.

Important Vocabulary Define each term or concept.

Exponential form

Scientific notation

Principal *n*th root

Rational exponent

I. Exponents (Pages 12–13)

What you should learn
How to use properties of exponents

In general, if b is a real number and r is a positive integer, then $b^r = \underbrace{b \cdot b \cdot b \cdots b}_{r \text{ factors}}$, where r is the _____ and b is the _____.

Complete the following properties of exponents.

$(ab)^m =$ _____ $a^{m+n} =$ _____

$\frac{1}{a^n} =$ _____ $|a^2| =$ _____

$\frac{a^m}{a^n} =$ _____ $a^{mn} =$ _____

$a^0 =$ _____ $\left(\frac{a}{b}\right)^m =$ _____

II. Scientific Notation (Page 14)

What you should learn
How to use scientific notation to represent real numbers

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.

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)

What you should learn
How to use properties of radicals

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 . . .

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)

What you should learn
How to simplify and combine radicals

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

1)

2)

3)

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

Example 3: Explain how to simplify a radical.

V. Rationalizing Denominators and Numerators (Pages 18–19)

What you should learn
How to rationalize denominators and numerators

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 $\dfrac{4+\sqrt{13}}{5-\sqrt{8}}$.

VI. Rational Exponents (Pages 19–20)

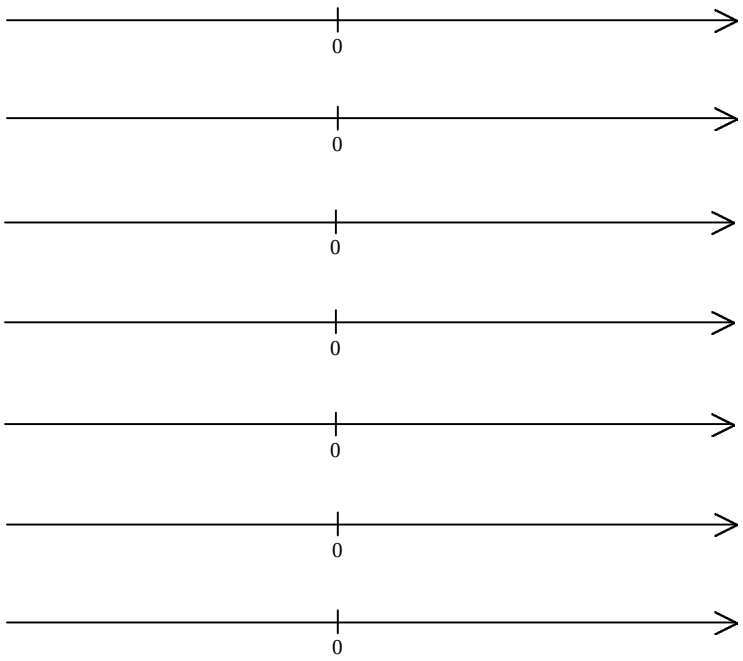
What you should learn
How to use properties of rational exponents

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 $\dfrac{x^{3/4}}{x^{2/3}}$.

Additional notes



Homework Assignment

Page(s)

Exercises