Simplifying Rational Exponents Foldable

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Polka Dot Frame Shades by Mercedes Hutchens

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Instructions

Print or copy page 3 and 4 double sided.

Place the paper so the examples are face down.

Cut along the dotted lines to create flaps.

Flip and fold the flaps inwards.

Glue the foldable into notes or on a piece of construction paper.

Go through the foldable with your students.

Rewrite the expression using Rational Exponent Notation

Rewrite the expression using Radical Notation

Quotient Rule with Rational Exponents

Product Rule with Rational Exponents

Negative and Zero Rules with Rational Exponents

Power Rule with Rational Exponents

Rewrite the expression using Radical Notation. Then simplify if possible.

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m$$

1) $9^{\frac{1}{2}}$ 2) $8^{\frac{2}{3}}$ 3) $x^{\frac{3}{5}}$

Rewrite the expression using Rational Exponent Notation

$$\left(\sqrt[n]{a}\right)^m = \sqrt[n]{a^m} = a^{\frac{m}{n}}$$

4) $\sqrt[5]{13}$ 5) $\sqrt[3]{25}$ 6) $\left(\sqrt{7}\right)^5$

Product Rule with Rational Exponents

$$a^m \cdot a^n = a^{m+n}$$

7) $x^{\frac{1}{5}} \cdot x^{\frac{3}{5}}$ 8) $\sqrt[4]{x} \cdot \sqrt[3]{x^2}$

Quotient Rule with Rational Exponents

$$\frac{a^m}{a^n} = a^{m-n}$$

9) $\dfrac{x^{\frac{7}{10}}}{x^{\frac{6}{10}}}$ 10) $\dfrac{\sqrt[6]{x^5}}{\sqrt[6]{x^2}}$

Power Rule with Rational Exponents

$$\left(a^m\right)^n$$

11) $\left(x^{\frac{3}{5}}\right)^{\frac{1}{2}}$ 12) $\left(x^{\frac{3}{4}}\right)^{\frac{2}{3}}$

Negative and Zero Rules with Rational Exponents

$$a^{-n} = \left(\frac{1}{a}\right)^n \qquad a^0 = 1$$

13) $\left(\dfrac{4}{9}\right)^{\frac{-3}{2}}$ 14) $\left(x^{\frac{3}{4}}\right)^0$

Rewrite the expression using Radical Notation. Then simplify if possible.

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} = \left(\sqrt[n]{a}\right)^m$$

1) $9^{\frac{1}{2}} = \sqrt[2]{9^1}$
$= \sqrt{9}$
$= 3$

2) $8^{\frac{2}{3}} = \sqrt[3]{8^2}$
$= \sqrt[3]{64}$
$= 4$

3) $x^{\frac{3}{5}} = \sqrt[5]{x^3}$

Rewrite the expression using Rational Exponent Notation

$$\left(\sqrt[n]{a}\right)^m = \sqrt[n]{a^m} = a^{\frac{m}{n}}$$

4) $\sqrt[5]{13} = 13^{\frac{1}{5}}$

5) $\sqrt[3]{25} = \sqrt[3]{5^2} = 5^{\frac{2}{3}}$

6) $\left(\sqrt{7}\right)^5 = 7^{\frac{5}{2}}$

Product Rule with Rational Exponents

$$a^m \cdot a^n = a^{m+n}$$

7) $x^{\frac{1}{5}} \cdot x^{\frac{3}{5}} = x^{\frac{4}{5}}$

8) $\sqrt[4]{x} \cdot \sqrt[3]{x^2} = x^{\frac{1}{4}} \cdot x^{\frac{2}{3}}$
$= x^{\frac{11}{12}}$

Quotient Rule with Rational Exponents

$$\frac{a^m}{a^n} = a^{m-n}$$

9) $\dfrac{x^{\frac{7}{10}}}{x^{\frac{6}{10}}} = x^{\frac{1}{10}}$

10) $\dfrac{\sqrt[6]{x^5}}{\sqrt[6]{x^2}} = \dfrac{x^{\frac{5}{6}}}{x^{\frac{2}{6}}} = x^{\frac{3}{6}} = x^{\frac{1}{2}}$

Power Rule with Rational Exponents

$$\left(a^m\right)^n$$

11) $\left(x^{\frac{3}{5}}\right)^{\frac{1}{2}} = x^{\frac{3}{10}}$

12) $\left(x^{\frac{3}{4}}\right)^{\frac{2}{3}} = x^{\frac{6}{12}} = x^{\frac{1}{2}}$

Negative and Zero Rules with Rational Exponents

$$a^{-n} = \left(\frac{1}{a}\right)^n \qquad a^0 = 1$$

13) $\left(\dfrac{4}{9}\right)^{\frac{-3}{2}} = \left(\dfrac{9}{4}\right)^{\frac{3}{2}}$
$= \left(\sqrt[2]{\dfrac{9}{4}}\right)^3 = \dfrac{27}{8}$

14) $\left(x^{\frac{3}{4}}\right)^0 = 1$