

8-3 Rational Exponents

1, 4, 9, 16, 25, 36

$$a^{\left(\frac{1}{2}\right)} = \sqrt{a}$$

$$36^{\frac{1}{2}} = 6$$

$$\sqrt{1} = 1$$

$$4^{\frac{1}{2}} = 2$$

$$9^{\frac{1}{2}} = 3$$

$$16^{\frac{1}{2}} = 4$$

$$25^{\frac{1}{2}} = 5$$

Aug 20-3:41 PM

1, 8, 27, 64, 125, 216

$$a^{\left(\frac{1}{3}\right)} = \sqrt[3]{a}$$

$$8^{\frac{1}{3}} = 2$$

$$27^{\frac{1}{3}} = 3$$

$$64^{\frac{1}{3}} = 4$$

$$125^{\frac{1}{3}} = 5$$

$$216^{\frac{1}{3}} = 6$$

$$1^{\frac{1}{3}} = 1$$

Aug 20-4:03 PM

1, 8, 27, 64, 125, 216

$$a^{\left(\frac{2}{3}\right)} = \frac{\sqrt[3]{a^2}}{\sqrt[3]{1}} = \sqrt[3]{a^2}$$

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

$$4 = \sqrt[3]{2^3 \cdot 2^3}$$

$$27^{\frac{2}{3}} =$$

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

$$= 4 \cdot 4 = 16$$

Aug 28-10:52 AM

1, 16, 81, 256, 625, 1296

$$a^{\left(\frac{3}{4}\right)} = \frac{\sqrt[4]{a^3}}{\sqrt[4]{1}} = \sqrt[4]{a^3}$$

$$\sqrt[4]{16^3} = \sqrt[4]{2^4 \cdot 2^4 \cdot 2^4}$$

$$2 \cdot 2 \cdot 2 = 8$$

Aug 20-4:04 PM

Fractional exponent

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

n is an integer bigger than or equal to 2

Feb 15-8:55 AM

Write each of the following as a radical and simplify, if possible.

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

$$(-64)^{\frac{1}{3}} = \sqrt[3]{-64} \\ = -4$$

$$100^{\frac{1}{2}} = \sqrt{100}$$

$$z^{\frac{1}{2}} = \sqrt{z}$$

Feb 15-9:05 AM

$$25^{\frac{1}{2}} = \sqrt{25} = 5$$

$$(-27)^{\frac{1}{3}} = \sqrt[3]{-27} = -3$$

$$b^{\frac{1}{2}} = \sqrt{b}$$

Feb 15-9:08 AM

Rewrite in exponent form

$$\sqrt[7]{x} = x^{\frac{1}{7}}$$

$$\sqrt[4]{b} = b^{\frac{1}{4}}$$

$$\sqrt[12]{r} = r^{\frac{1}{12}}$$

$$\sqrt[5]{d} = d^{\frac{1}{5}}$$

Feb 15-9:10 AM

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

a is real, m/n is a rational number in lowest terms with n bigger or equal to 2

Feb 15-9:26 AM

Write each of the following as a radical and simplify, if possible.

$$25^{\frac{3}{2}} = \sqrt{25^3} = (\sqrt{25})^3 = 5^3 = 125$$

$$64^{\frac{2}{3}} = \left(\sqrt[3]{64}\right)^2 = 4^2 = 16$$

$$(-8)^{\frac{4}{3}} = \left(\sqrt[3]{-8}\right)^4 = (-2)^4 = 16$$

Feb 15-9:35 AM

Write each of the following as a radical and simplify, if possible.

$$27^{\frac{2}{3}} = (\sqrt[3]{27})^2 = 3^2 = 9$$

$$16^{\frac{3}{2}}$$

Feb 15-9:38 AM

Rewrite in exponent form

$$\sqrt[3]{x^2} = x^{\frac{2}{3}}$$

$$\begin{aligned} (\sqrt[4]{r})^2 &= r^{\frac{2}{4}} \\ &= r^{\frac{1}{2}} \\ &= \sqrt{r} \end{aligned}$$

$$\sqrt[8]{a^3} = a^{\frac{3}{8}}$$

$$\begin{aligned} (\sqrt[3]{h})^9 &= h^{\frac{9}{3}} \\ &= h^3 \end{aligned}$$

Feb 15-9:39 AM

Just a reminder.

Exponent Rules

$$a^0 = 1 \quad \text{if } a \neq 0$$

$$a^{-n} = \frac{1}{a^n} \quad \text{or} \quad \frac{1}{a^{-n}} = a^n \quad \text{if } a \neq 0$$

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

$$\frac{a^m}{a^n} = a^{m-n} \quad \text{if } a \neq 0$$

$$(a^m)^n = a^{m \cdot n}$$

$$(a \cdot b)^n = a^n \cdot b^n$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n} \quad \text{if } b \neq 0$$

$$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n \quad \text{if } a \neq 0, b \neq 0$$

Feb 17-7:13 PM

$$r^{\frac{3}{4}} \cdot r^{\frac{1}{6}} \left(\frac{3}{3} \cdot \frac{3}{4} + \frac{1}{6} \cdot \frac{2}{2} \right)$$

$$\frac{9}{12} + \frac{2}{12} = \frac{11}{12}$$

$$r^{\frac{11}{12}} = \sqrt[12]{r^{11}}$$

$$x^{\frac{2}{3}}$$

$$x^{\frac{1}{5}}$$

$$\left(\frac{5}{5}\right) \frac{2}{3} - \left(\frac{1}{5} \cdot \frac{3}{3}\right)$$

$$\frac{10}{15} - \frac{3}{15} = \frac{7}{15}$$

$$x^{\frac{7}{15}} = \left(\sqrt[15]{x}\right)^7$$

Feb 17-7:23 PM

Simplify using properties of exponents. Leave answers with rational exponents

$$x^{\frac{1}{2}} \cdot x^{\frac{1}{3}}$$

$$\frac{x^{\frac{1}{3}}}{x^{\frac{5}{3}}}$$

Feb 17-7:21 PM

Mar 1-10:52 AM

Attachments

1-4 Rational Exponents - Calculator task.docx