Rational Exponents and Radicals

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

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

Oct 29-4:08 PM

What is the simplified form of each expression?

A $\sqrt[3]{125}$ $5 \cdot 5 \cdot 5 = 125$ (5)

B $\sqrt[4]{16}$ $2 \cdot 2 \cdot 2 \cdot 2 = 16$ (2)

What is the simplified form of each expression?

a. $\sqrt[3]{27}$ $3 \cdot 3 \cdot 3 = 27$ (3)

b. $\sqrt[5]{32}$ $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$ (2)

c. $\sqrt[3]{64}$ $4 \cdot 4 \cdot 4 = 64$ (4)

d. $\sqrt[2]{36}$ $6 \cdot 6 = 36$ (6)

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$$x^{\frac{a}{b}} = \sqrt[b]{x^a}$$

Example:

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

$2 \cdot 2 \cdot 2 = 8$

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Simplify:

a. $(16)^{\frac{3}{4}}$ $\sqrt[4]{16^3}$ 2^3 (8)

b. $(64)^{\frac{5}{6}}$ $\sqrt[6]{64^5}$ 2^5 (32)

c. $(125)^{\frac{2}{3}}$ $\sqrt[3]{125^2}$ 5^2 (25)

Nov 6-10:12 AM

What is each in radical form?

a. $(a)^{\frac{5}{6}}$ $\sqrt[6]{a^5}$

b. $(25x)^{\frac{3}{2}}$ $25^{3/2} x^{3/2}$ $\sqrt{25^3}\ \sqrt{x^3}$ 5^3 $125\sqrt{x^3}$

c. $(27y)^{\frac{2}{3}}$ $27^{2/3} y^{2/3}$ $\sqrt[3]{27^2}$ 3^2 $9\sqrt[3]{y^2}$

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What is $(16a)^{\frac{3}{2}}$ in radical form?

$16^{3/2} a^{3/2}$

$\sqrt{16^3} = 4^3 =$ $64\sqrt{a^3}$

What is $12a^{\frac{2}{3}}$ in radical form?

$12\sqrt[3]{a^2}$

Nov 6-12:35 PM

What is each exponential expression in radical form?

a. $25x^{1/2}$ $25\sqrt{x}$

b. $(5x)^{1/3}$ $\sqrt[3]{5x}$

c. $54y^{2/3}$ $54\sqrt[3]{y^2}$

d. $(25x)^{1/2}$ $25^{1/2}x^{1/2}$ $\sqrt{25}\sqrt{x}$ $5\sqrt{x}$

e. $5x^{1/3}$ $5\sqrt[3]{x}$

f. $(54y)^{2/3}$ $54^{2/3}y^{2/3}$ $\sqrt[3]{(54y)^2}$

Nov 4-2:33 PM

What is the following in exponential form? Simplify your answers:

a. $\sqrt[5]{b^3}$ $b^{3/5}$

b. $\sqrt[3]{27d^3}$ $27^{1/3}d^{3/3}$ $3d$

c. $12\sqrt[5]{x^4}$ $12x^{4/5}$

Oct 29-4:26 PM

Write each radical expression in exponential form.

a. $\sqrt[3]{s^2}$ $s^{2/3}$

b. $12\sqrt[3]{x^4}$ $12x^{4/3}$

c. $\sqrt[2]{(4y)^5}$ $4^{5/2}y^{5/2}$ $32y^{5/2}$

d. $\sqrt[4]{256a^8}$ $256^{1/4}a^{8/4}$ $4a^2$

Apr 8-12:44 PM

Write each radical expression in exponential form.

$\frac{1}{\sqrt{(4y)^5}}$ $\frac{1}{4^{5/2}y^{5/2}}$ $\frac{1}{32y^{5/2}} = 32^{-1}y^{-5/2}$

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

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Classwork: **worksheet #1 - 32**

Final Five

1. Which of the following expressions is equivalent to $(8x)^{\frac{4}{3}}$?

(A) $16\sqrt[3]{x^4}$ (C) $\sqrt[3]{8x^4}$

(B) $\sqrt[4]{16x^3}$ (D) $8\sqrt[4]{x^3}$

2. Which of the following expressions is equivalent to $4\sqrt{b^5}$?

(F) $2b^{\frac{2}{5}}$ (H) $(2b)^{\frac{2}{5}}$

(G) $(4b)^{\frac{5}{2}}$ (I) $4b^{\frac{5}{2}}$

Nov 6-12:36 PM