Pre-Calculus 11 - VLN

Chapter 5: Radicals

Lesson 2: Exponents and Radicals

Question #1

Reference Q.20470

Prove that $4^{\frac{1}{2}} \times 4^{\frac{1}{2}} = 4$

Question #2

Reference Q.20471

Exaplain why $7^{\frac{1}{4}}$ is the fourth root of 7.

Question #3

Reference Q.20489

Exaplain why $a^{\frac{1}{3}}$ is the cubed root of a.

Question #4

Reference Q.14425

Evaluate without the use of a calculator.

a. $4^{\frac{1}{2}}$

b. $100^{\frac{1}{2}}$

c. $64^{\frac{1}{3}}$

d. $9^{\frac{3}{2}}$

e. $49^{\frac{3}{2}}$

f. $16^{\frac{3}{4}}$

g. $8^{\frac{2}{3}}$

h. $125^{\frac{1}{3}}$

i. $(6^2 + 8^2)^{\frac{3}{2}}$

j. $(0.04)^{0.5}$

Question #5

Reference Q.14440

A cube has a volume of $216\ \text{cm}^3$.

a. Write a power which represents the edge length of the cube.

b. Write a power which represents the surface area of the cube.

c. Calculate the exact edge length and surface area of the cube.

Question #6

Reference Q.14441

A cube has a volume of $V\ \text{cm}^3$.

a. Write a power and a radical which represents the edge length of the cube.

b. Write a power and a radical for the area of one of the faces of the cube.

Question #7

Reference Q.14449

Write each radical as a power in the form $a^n, n \in \mathbb{Q}$.

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

b. $\sqrt[5]{a^4}$

c. $\sqrt{a^5}$

d. $\dfrac{1}{\sqrt[4]{a}}$

e. $\dfrac{1}{\sqrt[4]{a^5}}$

Question #8

Reference Q.20472

a. Evaluate $\sqrt[4]{16^5}$ by taking the root first.

b. Evaluate $\sqrt[4]{16^5}$ by taking the exponent first (ie. do 16^5 first).

c. Which method would be easier to do without the use of a calcuator?

Question #9

Reference Q.20473

a. Evaluate $81^{\frac{3}{4}}$ by evaluating the root first.

b. Evaluate $81^{\frac{3}{4}}$ by taking the exponent first (ie. do 81^3 first).

c. Which method would be easier to do without the use of a calcuator?

Question #10

Reference Q.20474

Evaluate each of the following:

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

b. $\sqrt[3]{125^2}$

c. $128^{\frac{3}{7}}$

d. $\sqrt{16^2}$

Question #11

Reference Q.14443

Write each power as an entire radical.

a. $a^{\frac{4}{5}}$

b. $b^{\frac{3}{2}}$

c. $c^{\frac{1}{4}}$

d. $x^{-\frac{2}{5}}$

e. $y^{-\frac{1}{3}}$

f. $5h^{\frac{2}{3}}$

g. $(5h)^{\frac{2}{3}}$

h. $-r^{\frac{5}{4}}$

i. $(-r)^{\frac{5}{4}}$

j. $2x^{-\frac{1}{2}}$

Question #12

Reference Q.14436

Write an equivalent expression using radicals.

a. $(a)^{\frac{1}{4}}$

b. $(b)^{\frac{1}{2}}$

c. $(c)^{\frac{1}{5}}$

d. $(d)^{\frac{-1}{2}}$

e. $(e)^{-\frac{1}{10}}$

f. $(f)^{\frac{2}{3}}$

g. $(g)^{\frac{4}{3}}$

h. $(h)^{\frac{5}{2}}$

i. $(i)^{-\frac{3}{2}}$

j. $(j)^{-\frac{4}{5}}$

k. $(k)^{-\frac{3}{4}}$

l. $(l)^{\frac{m}{n}}$

Question #13

Reference Q.14503

Which expression is not equivalent to the others?

A. $a^{-\frac{4}{3}}$

B. $\left(\frac{1}{a^4}\right)^3$

C. $(\sqrt[3]{a})^{-4}$

D. $\frac{1}{\sqrt[3]{a^4}}$

Question #14

Reference Q.14502

Which of the following is equivalent to $(-x^3)^{-\frac{5}{3}}$?

A. x^5

B. $-x^{\frac{1}{5}}$

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

D. $-\frac{1}{x^5}$

Question #15

Reference Q.20475

Simplify the following and write solution in radical form: $\left(\frac{x^3\sqrt{x}}{x^{\frac{1}{4}}}\right)^2$

Question #16

Reference Q.20476

Simplify the following and write solution in radical form: $\left(\frac{\sqrt[3]{x}}{x^2 x^{\frac{2}{5}}}\right)^{\frac{1}{3}}$

Question #17

Reference Q.20477

Simplify the following and write solution in radical form: $\sqrt{\frac{\sqrt{x}\sqrt[4]{x^7}}{x^{-2}}}$

Question #18

Reference Q.20370

a. Rewrite as a single power: $\left(\frac{(3)^4\sqrt{3^{-2}}}{\sqrt[4]{3^{-1}}}\right)^{-\frac{2}{3}}$

b. Convert your solution to a radical.

Question #19

Reference Q.20371

a. Rewrite as a single power: $\left(\frac{(5)^{-1/2}\sqrt[4]{5^{-1}}}{\sqrt{5}}\right)^{-\frac{5}{9}}$

b. Convert your solution to a radical.

Question #20

Reference Q.20372

a. Rewrite as a single power: $\sqrt[3]{\frac{\sqrt[3]{x^6}\sqrt{x^{-1}}}{\sqrt[4]{x}}}$

b. Convert your solution to a radical.

Question #21

Reference Q.20373

a. Rewrite as a single power: $\left(\sqrt[4]{\frac{x^{-7/6}\sqrt[4]{x^2}}{\sqrt{x^{-3}}}}\right)^{-\frac{1}{3}}$

b. Convert your solution to a radical.