7.1 Rational Exponents

NOTES

ALGEBRA 2

Write your questions here!

Review of Exponents:

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

Rewrite each in radical form:

Ex 1) Ex 2) Ex 3)

Rewrite each using a base that is an integer.

Ex 4) Ex 5) Ex 6)

Simplify:

Ex 7) Ex 8) Ex 9)

Ex 10) Ex 11) Ex 12)

Solve for x:

Ex 13)

Ex 14)

Ex 15)

Ex 16) $\sqrt{\sqrt[3]{(a+1)^5}} = (a+1)^x$

Can you solve these?:

The expression is equivalent to where a and b are both positive. Find the value of ?

Which function is equivalent to $F(x) = \frac{\sqrt{(x^{-2})}}{\left(x^{\frac{1}{4}}\right)^2}$ for all positive values of x?

a. $G(x) = \sqrt[3]{x^2}$ b. $H(x) = \sqrt[2]{x^3}$ c. $K(x) = -\sqrt[3]{x^2}$ d. $J(x) = \frac{1}{\sqrt[2]{x^3}}$

SUMMARY:

Now, summarize your notes here!

7.1 PRACTICE

Directions: Write each expression in exponential form.			
1) $\sqrt{6x}$	2) $\frac{1}{\sqrt{m}}$	3) $\left(\sqrt[4]{5n}\right)^5$	4) $\left(\sqrt[3]{-27g}\right)^2$
Directions: Write each expression in radical form.			
5) $(4m)^{5/3}$	6) $(-5x)^{7/4}$	7) $n^{1/3}$	8) $(8y)^{-3/4}$

Simplify.			
9) $\sqrt[3]{-64}$	10) $\left(\sqrt[3]{-27}\right)^{-4}$	11) $81^{3/2}$	12) $36^{3/2}$
13) $(-125)^{-2/3}$	14) $81^{-3/2}$	15) $125^{1/3}$	16) $343^{4/3}$

17. Which expression is equivalent to $\sqrt{5^8}$?: a. $5^{\frac{1}{3}}$ b. 5^3 c. 5^4 d. 5^6

A B C D

18. Which expression is equivalent to $\frac{\sqrt[3]{5^2}}{\left(5^{\frac{1}{3}}\right)^2}$?: a. $5^{\frac{2}{3}}$ b. 1 c. 0 d. 5

A B C D

Multiple Choice! Choose the ***BEST*** answer!

19. The expression 27^x is equivalent to 9^y where ***x*** and ***y*** are both positive. Find the value of $\frac{x}{y}$?

20. If $2^x \cdot 2^y = \sqrt[3]{2}$ and $x = \frac{1}{2}$, what is the value of y?

21. If $3x^3 = y^{12}$, solve for ***x*** in terms of ***y***, in radical form.

22. If k, n, x and y are positive values satisfying $x^{\frac{-4}{3}} = k^{-2}$ and $y^{\frac{4}{3}} = n^2$, what is $(xy)^{\frac{2}{3}}$ in terms of n and k?

Solve the following equations:

23. $2x^{\frac{2}{3}} - 7 = 11$

24. $9^{2x-5} = 27$

25. $25^{2x-1} = 125^{3x+4}$

26. $\left(\sqrt[x]{5}\right)^4 = 25$

27. $64^{2x} = 16$

28. $\sqrt{\sqrt[4]{(k-21)^5}} = (k-21)^x$

29. $\sqrt[3]{x+4} = 2$

30. $5 = 3 + \sqrt[4]{2x+1}$

7.1 Rational Exponents

WRAP UP

1. $5x^{\frac{2}{3}} + 4 = 24$

2. $\left(\sqrt[3]{2}\right)^9 = 16^x$

3. Simplify: $(-125)^{-1/3}$

Extension: Simplify:

4. $\left(2^{\sqrt{3}}\right)^{\sqrt{3}}$

5. $\left(2^{\sqrt{2}}\right)^{\sqrt{2}}\left(3^{\sqrt{3}}\right)^{\sqrt{3}}$

6. $\left(3^{1+\sqrt{2}}\right)^{1-\sqrt{2}}$

7. ***Test PREP!*** One is multiple choice; the other is free response where you must grid in your answer. Blow it up.

MULITPLE CHOICE

a. If *n* and *p* are positive integers and $2^{n/p} = \sqrt[3]{32}$, then the product of *n* and *p* is:

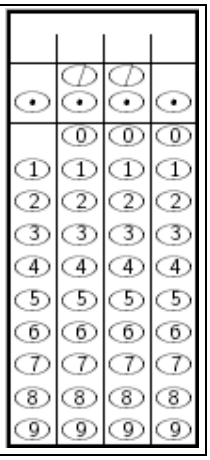
(A) -16
(B) 15
(C) 14
(D) 18

Grid your answer here ↓

A	B	C	D
○	○	○	○

GRID IN

b. If $p^m \cdot p^{-5} = p^{10}, and\ (p^{-3})^n = p^{-21}$. what is the value of *m* - *n*?



8. Show that $\left(\sqrt{x} + \sqrt{y}\right)^2$ is not equal to $(x^1 + y^1)$ when $x = 9$ and $y = 16$.

(Out of this world) EXIT TICKET!

Kepler's third law of planetary motion relates the average distance of a planet from the sun to the time it takes the planet to complete one full orbit around the sun. The equation $t^2 = a^3$ describes the law where *a* is the distance the planet is from the sun and t is the time measured in (Earth) years. The distance ***a*** is measured in AUs, which is the average distance from the sun to the Earth.

a) Solve the equation for a.

Answer: $a =$

b) Venus takes about 0.62 Earth years to orbit the sun. Use your answer to a) to find the average distance from the sun to Venus.

Answer:_____ AUs

c) Mercury is about .39AUs from the sun. About how many days does it take for Mercury to orbit the sun?

Answer:_____ days