



Warm Up

Quiz Friday

Similar to this

plus a laws of exponents question

Express each as a radical then evaluate:

$$a) (216)^{\frac{2}{3}} = (\sqrt[3]{216})^2 = (6)^2 = 36$$

$$b) (1024)^{\frac{3}{5}} = (\sqrt[5]{1024})^3 = (4)^3 = 64$$

Express each as a power:

$$a) \sqrt[4]{625} = 625^{\frac{1}{4}}$$

$$b) (\sqrt[5]{32})^7 = 32^{\frac{7}{5}}$$

Express each in simplest radical form: Entire \rightarrow Mixed

$$a) \sqrt{405} = \sqrt{81 \times 5} = \sqrt{81} \times \sqrt{5} = 9\sqrt{5}$$

$$b) \sqrt[3]{500} = \sqrt[3]{125 \times 4} = \sqrt[3]{125} \times \sqrt[3]{4} = 5\sqrt[3]{4}$$

Write the radical for the power and evaluate: (Use calculator but show work)

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

$$b) 7776^{\frac{3}{5}} = \sqrt[5]{7776^3} = 6^3 = 216$$

$$x^{\frac{m}{n}} = \sqrt[n]{x^m}$$

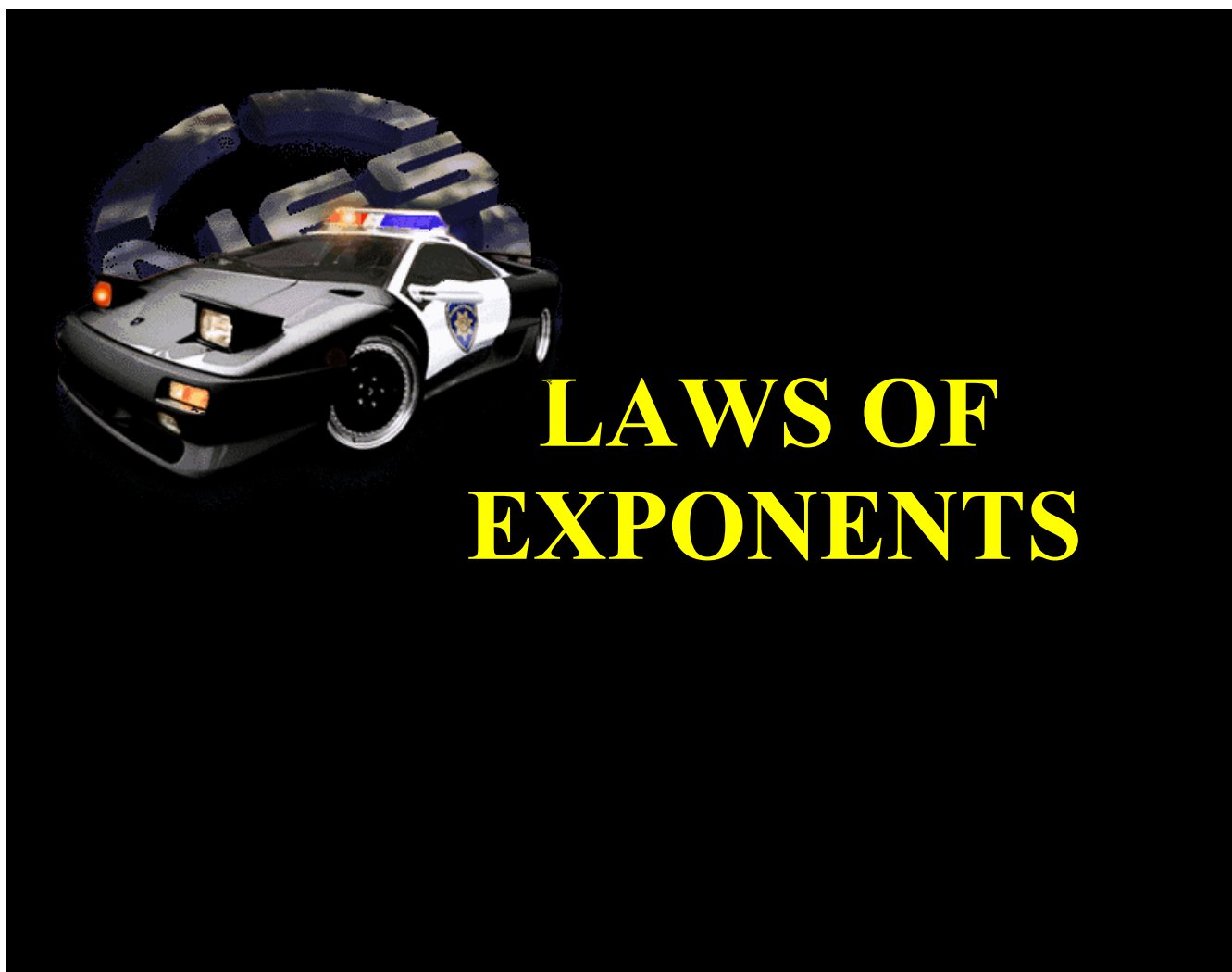
OR

$$= \sqrt[n]{x^m}$$

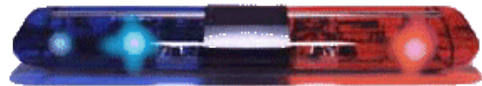
Any Homework Questions?

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3(adf), 4(acd), 5(abc), 6ac), 8a,b,c, 9,
12(a,b,c), 15



Laws Of Exponents



Law #1: Product Rule

$$b^m \times b^n = b^{m+n}$$

- when multiplying powers with the same base you add the exponents

Exercise:

Simplify the following using the laws of exponents

a) $3^2 \times 3^4$
 3^6

b) $4^3 \times 3^4$
 base not same

c) $(q^7)(q)$
 q^8

d) $p \times p^3 \times p^2$
 p^6
 understood!

e) $(2x^3)(4x^2)$

f) $(3z^3)(6z^{12})$

Law #2: Quotient Rule

$$b^m \div b^n = b^{m-n}$$

- when dividing powers with the same base you subtract the exponents

Exercise:

Simplify the following using exponent laws

a) $5^{23} \div 5^{12}$
 5^{23-12}
 $= 5^{11}$

b) $\frac{x^{34}}{x^{19}}$ $= x^{34-19}$
 $= x^{15}$

c) $c^3 \div e^2$
 ↙ ↘
 not same base

d) $\frac{12x^3}{4x}$ ← understood

$3x^{3-1}$

$3x^2$

e) $\frac{25c^{30}}{5c^{23}}$

$5c^7$

Law #3: Power Rule

when raising a power to another power...MULTIPLY the exponents."

$$(b^m)^n = b^{mn}$$

Law #4: Power of Product

when a product is raised to a power, each of the factors are raised to the power."

$$(ab)^m = a^m b^m$$

- when brackets are involved you must multiply the exponents

Exercise:

Simplify the following using Laws of Exponents

a) $(m^3)^4$
 $= m^{3 \times 4}$
 $= m^{12}$

b) $(x^2 y^4)^3$
multiply exponents
 $x^{2 \times 3} y^{4 \times 3}$
 $= x^6 y^{12}$

c) $(2d^3)^3$
 $(2^3 d^{3 \times 3})$
 $2^3 d^9$
 $8 d^9$

d) $(2m^4 n)^2 (m^3 n^2)$
 $2^2 m^8 n^2 m^3 n^2$
 $4 m^{8+3} n^{2+2}$
 $4 m^{11} n^4$

understood 1 as exponent

Law #5:**Power of Quotient Rule**

when a quotient is raised to a power, both the divisor and the dividend are raised to the power."

$$\cdot \left(\frac{a}{b}\right)^n = \left(\frac{a^n}{b^n}\right)$$

Law #6: Zero Rule

$$b^0 = 1$$

- any power raised to the exponent 0 (zero) is equal to 1

Page 241-241 3ac, 5ac, 6ac, 8aceg, 9aceg

~~# 1 to 10 on Worksheet~~

Attachments

grade_10_nrf_worksheet_exponent_laws_assignment_1_pdf.pdf