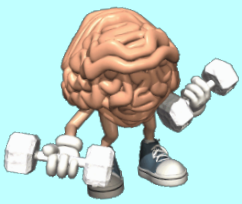


Warm Up

1) $[(-2)^3 \times (-2)^2] - [(-3)^3 - (-3)^2]$

$(-2)^5 - [(-3)^3 - (-3)^2]$

$-32 - [(-27) - 9]$

$-32 - [-36]$

$-32 + 36$

4

2) $\dfrac{[(2 \times 2^2)^5 - (5^6 \div 5^4)^4]^0}{(3^3 \times 3)^2 - (3^6 \div 3^4)^2}$

$\dfrac{1}{(3^4)^2 - (3^2)^2}$

$3^8 - 3^4$

$6561 - 81$

$\dfrac{1}{6480}$

Write the reciprocal for each:

4. a) $\dfrac{2}{3} = \dfrac{3}{2}$ b) $\dfrac{242}{1} = \dfrac{1}{242}$ c) $\dfrac{1}{6} = 6$ d) $\dfrac{8^2}{1} = \dfrac{1}{8^2}$ $\dfrac{1}{64}$

Simplify the following (Leave your answer with positive exponents):

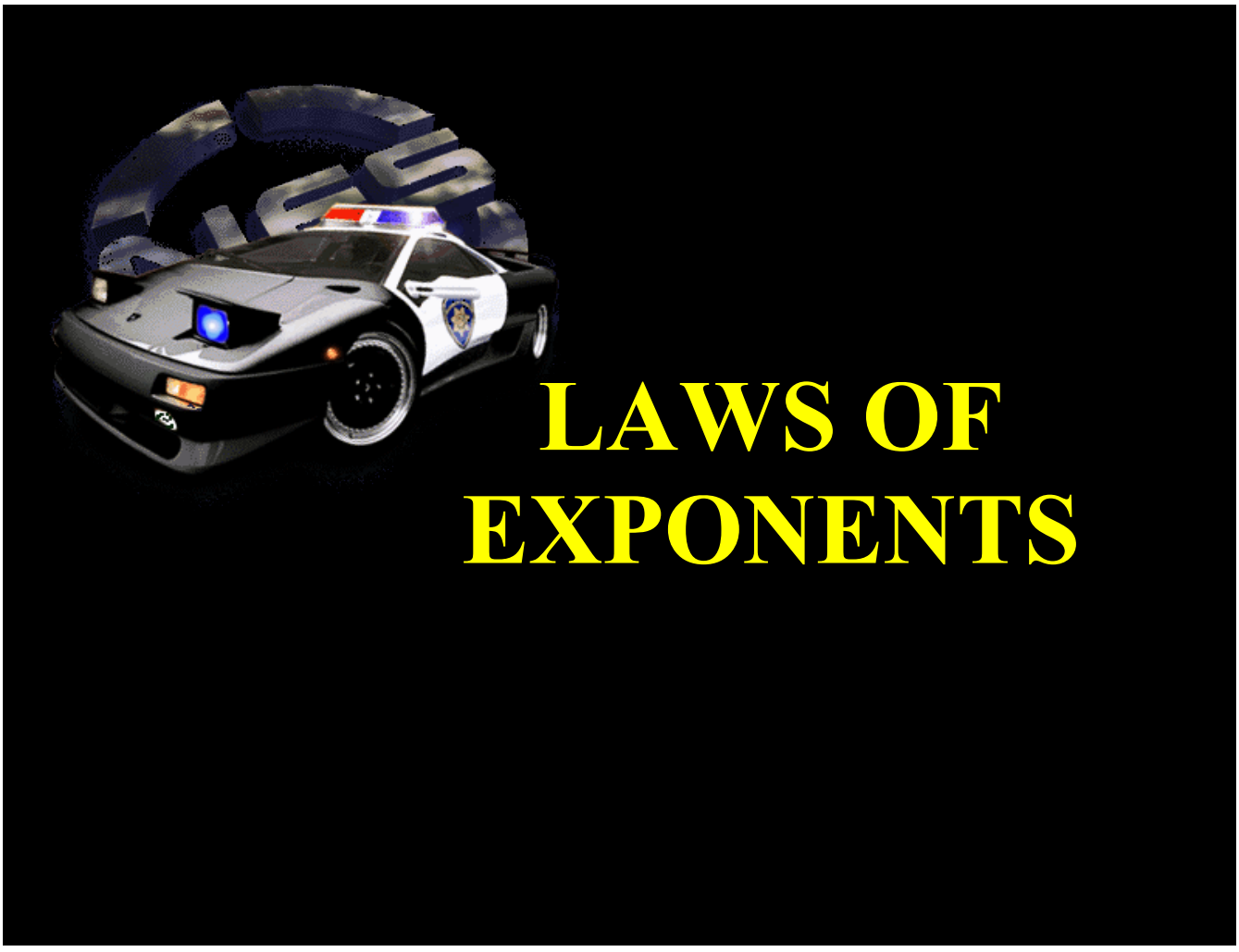
a) $(3xy^2)^4$

$3^4 x^4 y^8$

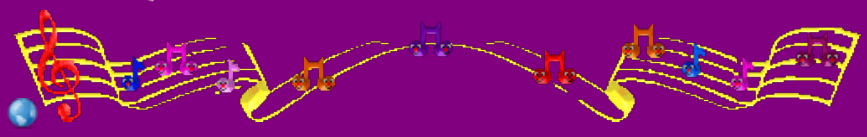
$81x^4y^8$

b) $\dfrac{(12r^{12}t^3)}{(3r^{10}t^2)}$

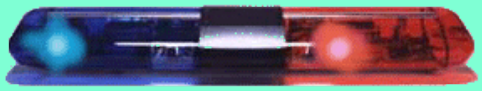
$4r^2t$


LAWS OF
EXPONENTS

Exponent Laws



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) $4^3 \times 3^4$ Can't Simplify

c) $(q^7)(q^1)$ q^8

d) $p^1 \times p^3 \times p^2$ p^6

e) $(2x^3)(4x^2)$ $8x^5$

f) $(3z^3)(6z^{12})$ $18z^{15}$

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^{11}

b) $\frac{x^{34}}{x^{19}}$

x^{15}

c) $c^3 \div c^2$

c^1

$= c$

d) $\frac{12x^3}{4x^1}$

$= 3x^2$

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) $(m^3)^4$ b) $(x^2y^4)^3$ c) $(2d^3)^3$ d) $(2m^4n)^2(m^3n^2)$

m^{12} x^6y^{12} 2^3d^9 $2^2m^8n^2$

$(2^2m^8n^2)(m^3n^2)$

$8d^9$

$4m^{11}n^4$