Quiz Tomorrow:

1) Classifying as Rational or Irrational

a) $\sqrt{72}$ Q

b) $\sqrt{225}$ Q

c) $\sqrt[4]{81}$ Q

2) Use Power & Radical function on calculator...

ex. Order Least to Greatest

$\sqrt[5]{108}$ (2) ≈ 2.55, $3\sqrt{10}$ (4) ≈ 9.49, $\sqrt[3]{58}$ (3) ≈ 3.87, $(3.71)^{-0.38}$ (1) ≈ 0.61

3/ Simplifying Radicals...

ex. $\sqrt{75}$

$\sqrt{25} \cdot \sqrt{3}$

$5\sqrt{3}$

$\sqrt{300}$

$\sqrt{100} \cdot \sqrt{3}$

$10\sqrt{3}$

$4\sqrt{18}$

$4(\sqrt{9} \cdot \sqrt{2})$

$4(3\sqrt{2})$

$12\sqrt{2}$

$6\sqrt{108}$

$6(\sqrt{36} \cdot \sqrt{3})$

$6(6\sqrt{3})$

$36\sqrt{3}$

$\sqrt[3]{54}$

$\sqrt[3]{27} \cdot \sqrt[3]{2}$

$3\sqrt[3]{2}$

$2\sqrt[5]{96}$ $\quad 2^5 = 32$

$2(\sqrt[5]{32} \cdot \sqrt[5]{3})$

$2(2\sqrt[5]{3})$

$= 4\sqrt[5]{3}$

4/ Express as Entire Radicals...

ex ① $3\sqrt{2}$

$= \sqrt{3^2 \cdot 2}$

$= \sqrt{18}$

② $5\sqrt{8}$

$= \sqrt{5^2 \cdot 8} = \sqrt{200}$

③ $4\sqrt[3]{2}$

$\sqrt[3]{4^3 \cdot 2}$

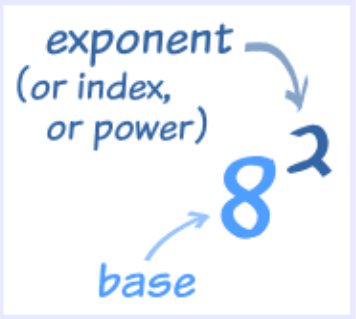
$\sqrt[3]{128}$

④ $-3\sqrt[4]{5}$ $3 \times 3 \times 3 \times 3$

$= -\sqrt[6]{3^6 \cdot 5}$

$= -\sqrt[6]{3645}$

Laws of Exponents



The exponent of a number says **how many times to multiply** the number.

In this example: $8^2 = 8 \times 8 = 64$

- In words: 8^2 could be called "8 to the second power", "8 to the power 2" or simply "8 squared"

Product Law:

The law that $x^m x^n = x^{m+n}$

With $x^m x^n$, how many times will you end up multiplying "x"? *Answer:* first "m" times, then **by another** "n" times, for a total of "m+n" times.

Example: $x^2x^3 = (xx) \times (xxx) = xxxxx = x^5$

So, $x^2x^3 = x^{(2+3)} = x^5$

The multiplication law states that when multiplying two powers with the same base we add the exponents.

$$(y^3)(y^2) = y^5$$

These have the same base.

$$(y^3)(y^2) = y^5$$

The five comes from the addition of three and two... (2 + 3 = 5)

Why Add?

ex: 1) $w^7 \cdot w^8 = w^{15}$

2) $1x^2 \cdot 1x^1 \cdot 3x^8 = 3x^{11}$

3) $7^2 \cdot 7^{15} = 7^{17}$ ✓

4) $(-2a^3b^6)(5a^4b^9) = -10a^7b^{15}$

Quotient Law:

The law that $x^m/x^n = x^{m-n}$ OR $\frac{x^m}{x^n}$ OR $x^m \div x^n$

Like the previous example, how many times will you end up multiplying "x"? Answer: "m" times, then **reduce that** by "n" times (because you are dividing), for a total of "m-n" times.

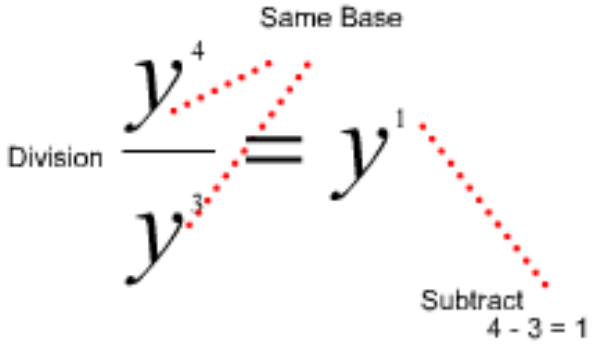
Example: $x^{4-2} = x^4/x^2 = (xxxx) / (xx) = xx = x^2$

$\frac{xxxx}{xx} = x^2$

(Remember that x/x = 1, so every time you see an x "above the line" and one "below the line" you can cancel them out.)

The division law states that when dividing powers with the same base we subtract the exponents.

$\frac{y^{12}}{y^3} = y^9$



Why does this work?

2. Simplify each of the following using the division law.

a. $\frac{x^8}{x^5}$ b. $\frac{y^7}{y^9}$ c. $\frac{15x^5}{3x^2}$ d. $\frac{100x^{13}}{25x^7}$

$= x^3$ $= y^{-2}$ $= 5x^3$ $= 4x^6$

What about these?

$\frac{15m^9}{4m^3}$ $\frac{(4x^3)(3x^4)}{4x^2}$ $\frac{24a^{10}b^6}{4a^2b^{12}}$

$= \frac{15}{4}m^6$ $= \frac{12x^7}{4x^2}$ $= 6a^8b^{-6}$

$= 3x^5$

$10^6 \times 10^{22} \div 10^3 \cdot 10^4$

$= 10^{28} \div 10^3 \cdot 10^4$

$= 10^{25} \cdot 10^4$

$= 10^{29}$

Attachments

applications of sequences.doc