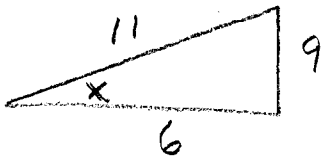
Alg. 1-BE Monday 4-5-10

1. 

$\sin x = ?$
$\cos x = ?$
$\tan x = ?$

LEAVE ANSWERS AS RATIOS

2. $(4x^2y^3)(3x^5y^8) = ?$

3. $10^5 \cdot 10^{12} = ?$

- 5 weeks left ⇒
  1. EXAM 1
  2. QUIZ 4
  3. QUIZ 5
  4. EXAM 2
  5. QUIZ 6

  NEW STUFF

  Course review
  Problems with
  NET Practice

  { SEMESTER EXAMS }

- 4 more SATURDAYS ⇒ 4/24, 5/1, 5/8, 5/15
- LAST after school help ⇒ 5/18 (TUES)

THE PROBLEM: Very large or very small numbers are a chore to write and a real chore to use in calculations if you stick to Standard Notation

(Ex) 463,000,000,000 (Ex) 0.000000362

The Solution: Use our "base 10" number system where each decimal place bigger is "times 10" and each decimal place smaller is "divided by 10" and our "Multiplication Rule for Exponents" to rewrite numbers in SCIENTIFIC NOTATION.

(Ex) 463,000,000,000.

COUNT DECIMAL PLACES UNTIL YOU NUMBER IS between 1 AND 10, IN this CASE 4.63.

REWRITE AS 4.63×10^{11}

↑ MADE SMALLER BY 10^{11}

↑ MUST MULT. BY 10^{11} to NOT CHANGE ORIGINAL number

NOTE: $10^{1} = 10$

$10^{2} = 100$

$10^{3} = 1000$

$10^{11} = 100{,}000{,}000{,}000$

Number of zeros in 10^{N} matches the exponent.

(EX) 0.0000000862

$$8.62 \times \frac{1}{10^{8}}$$

$$8.62 \times 10^{-8}$$

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*(D) A number is written in Scientific Notation

$$a \times 10^{N}$$

where $1 \leq a < 10$ and N is an integer

(EX) $10 = 1 \times 10^{1}$

$100 = 1 \times 10^{2}$

$1000 = 1 \times 10^{3}$

$0.1 = 1 \times 10^{-1}$

$0.01 = 1 \times 10^{-2}$

Ex 2 Pg 426 **Standard to Scientific Notation**

(A) 30,500,000

7 places

MADE SMALLER ↓ multiply by BIGGER

$\therefore 3.05 \times 10^{7}$

CAN ONLY DROP trailing zeros.

(B) 0.000781

4 places

MADE BIG ↓ MULTIPLY BY SMALLER

$\therefore 7.81 \times 10^{-4}$

$= 7.81 \cdot \frac{1}{10000}$

$= \frac{7.81}{10000} = \frac{781}{1000000}$ WHY?

Ex 1 Pg 426 **Scientific to Standard**

(A) 2.45×10^{8}

2 4 5 0 0 0 0 0 0 0

use 2 places to get to 245, ADD 6 zeros to get to 8

(B) 3×10^{-5}

0.00003

GO LEFT 1 place TO GET TO .3, then left 4 zeros

LETS TAKE THIS FORMAT OUT FOR A SPIN:

(EX) Multiply $42000000 \cdot 3000$

$4.2 \times 10^7 \cdot 3 \times 10^3$

$4.2 \cdot 3 \cdot 10^7 \cdot 10^3$

12.6×10^{10} Why?

$\boxed{1.26 \times 10^{11}}$ Proper scientific notation

MAKE SMALLER BY 10 — MAKE BIGGER BY 10

(EX) Multiply $60000 \cdot 0.00002$

$6 \times 10^4 \cdot 2 \times 10^{-5}$

12×10^{-1}

$\boxed{1.2}$ Actually 1.2×10^0

$10^0 = 1$

(EX) $80000 \div 200$

$\frac{8 \times 10^4}{2 \times 10^2} = \frac{8}{2} \cdot 10^{4-2}$

$= \boxed{4 \times 10^2}$ or 400

Ex 4 Pg 427 $(5\times10^{-8})(2.9\times10^{2})$

14.5×10^{-6} CAREFUL

ONE PLACE SMALLER — ONE PLACE BIGGER?

1.45×10^{-5} = 145

ONE place to get to .145
⇒ ADD 4 zeros in front

.0000145

(Ex) $\dfrac{1\times10^{12}}{2\times10^{6}} = .5\times10^{6}$

$= 5\times10^{5}$

Homework: ① Review Ch. 8-3

② Pg. 428 #1, 2, 26-29, 30-40 evens,
429 # 44, 45, 51