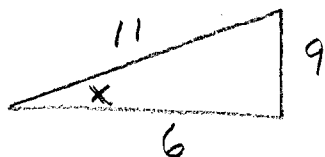


Alg. 1 - BE

MONDAY

4-9-12

①



$$\sin x = ?$$

$$\cos x = ?$$

$$\tan x = ?$$

LEAVE ANSWERS
AS RATIOS

② $(4x^2y^3)(3x^5y^8) = ?$

③ $10^5 \cdot 10^{12} = ?$

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

ⓔX 463,000,000,000 ⓔX 0.0000000362

The SOLUTIONS 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.

ⓔX 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: $10^{\textcircled{1}} = 10$
 $10^2 = 100$
 $10^3 = 1000$
 $10^n = 100,000,000,000$

Number of zeros
in 10^N matches
the exponent.

Ex 0.0000000862
 \rightarrow

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

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

*① 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

(B) 0.000781
 → 4 places

MADE BIG ↑ ↓ MULTIPLY BY SMALLER
 TRAILING ZEROS.
 $\therefore 7.81 \times 10^{-4}$

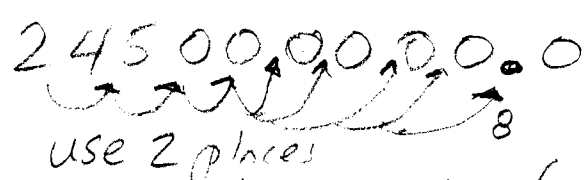
= $7.81 \cdot \frac{1}{10000}$

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

EX 1
Pg 426

Scientific to Standard

(A) 2.45×10^3



to get to 245, ADD 6 zeros to get to 3

(B) 3×10^{-5}



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

LETS TAKE THIS FORMAT OUT FOR A SEC:

(EX) Multiply 42000000 • 3000

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

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

$$12.6 \times 10^{10} \quad \text{WHY?}$$

1.26×10^{11} Proper scientific notation

MAKE Smaller by 10 MAKE Bigger by 10

(EX) Multiply 60000 • 0.00002

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

$$12 \times 10^{-1}$$

1.2

ACTUALLY 1.2×10^0
 $10^0 = 1$

(EX) 80000 ÷ 200

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

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

Ex 4
Pg 427

$$(5 \times 10^{-8})(2.9 \times 10^2)$$

$$14.5 \times 10^{-6}$$

CAREFUL

ONE PLACE SMALLER ONE PLACE BIGGER?

$$1.45 \times 10^{-5}$$

=

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

$$.0000145$$

$$\textcircled{\text{EX}} \frac{1 \times 10^{12}}{2 \times 10^6} = .5 \times 10^6 = 5 \times 10^5$$

Homework: ① Read Ch. 8-3

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