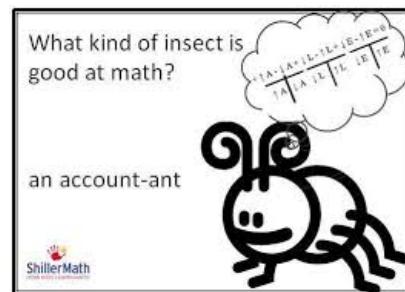


**Agenda:**

- 1) Bell Ringer: p. 1-2
- 2) Lesson 6: Numbers in Scientific Notation

EQ: What is scientific notation? Why is it used?  
How do you convert numbers into scientific notation?

- 3) Practice pages 5,6, 8
- 4) Homework: p. 9-10
- 4) Exit Ticket (p.14)



supply  
managers: pick  
up new  
turquoise books  
for group

Sep 10-9:19 AM

### Multiplying and Dividing Powers of Ten

#### Multiplication - add the exponents

$$\text{A. } 10,000 \times 100 = 1,000,000 \\ 10^4 \times 10^2 = 10^6$$

$$\text{B.) } 0.001 \times 0.1 = 0.0001 \\ 10^{-3} \times 10^{-1} = 10^{-4}$$

#### Division - subtract the exponents

$$\text{A.) } 10,000 \div 1,000 = 10 \\ 10^4 \div 10^3 = 10^1$$

$$\text{B.) } 0.001 \div 0.1 = 0.01 \\ 10^{-3} \div 10^{-1} = 10^{-2}$$

Sep 28-9:03 AM

Multiply or divide. Write the answer in exponential form.

1.)  $10^3 \times 10^{-4}$

$$\underline{10^{-1}}$$

2.)  $10^{-2} \times 10^{-1}$

$$\underline{10^{-3}}$$

3.)  $10^4 \times 10^{-5}$

$$\underline{10^{-1}}$$

4.)  $10^{-6} \times 10^8$

$$\underline{10^2}$$

11.)  $10^8 + 10^2$

$$\underline{10^6}$$

12.)  $10^4 \div 10^5$

$$\underline{10^{-1}}$$

13.)  $10^6 \div 10^{-1}$

$$\underline{10^7}$$

14.)  $10^4 \div 10^1$

$$\underline{10^3}$$

$$\begin{aligned} 6 - (-1) \\ 6 + 1 \end{aligned}$$

Sep 28-9:03 AM

5.)  $10^7 \times 10^1$

$$\underline{10^8}$$

6.)  $10^{-2} \times 10^{-5}$

$$\underline{10^{-7}}$$

7.)  $10^3 \times 10^{-5}$

$$\underline{10^{-2}}$$

8.)  $10^5 \times 10^5$

$$\underline{10^{10}}$$

9.)  $10^{-1} \times 10^{-4}$

$$\underline{10^{-5}}$$

10.)  $10^{-8} \times 10^4$

$$\underline{10^{-4}}$$

15.)  $10^{-3} \div 10^2$

$$\underline{10^{-5}}$$

16.)  $10^3 + 10^7$

$$\underline{10^{-4}}$$

17.)  $10^{-4} + 10^2$

$$\underline{10^{-6}}$$

18.)  $10^3 + 10^8$

$$\underline{10^{-5}}$$

19.)  $10^{-2} + 10^{-8}$

$$\underline{10^6}$$

20.)  $10^3 + 10^{-1}$

$$\underline{10^4}$$

$$-2 - (-8) = -2 + 8$$

$$3 - (-1) = 3 + 1$$

Sep 28-9:03 AM

Multiply or divide. Write each answer in exponential form.

1.)  $10^7 \times 10^7$   $10^{14}$

7.)  $10^4 \times 10^2$   $10^6$

2.)  $\frac{10^8}{10^3}$   $10^5$

8.)  $\frac{1,000}{10,000} = \frac{1}{10} = 10^{-1} = .1$

3.)  $10^{-9} \times 10^7$   $10^{-2}$

9.)  $10^{-5} \times 10^5$   $10^0$

4.)  $10^3 \times 10^{-3}$   $10^0$

10.)  $\frac{10,000}{100} = \frac{100}{10 \cdot 10} = 10^2$

5.)  $(10^7 \times 10^3) \times 10^{-3}$   $10^7$

11.)  $10^6 \times (10^3 \times 10^{-3})$   $10^6$

6.)  $0.1 \times 0.001$   $10^{-4}$

12.)  $10,000 \times 0.01$   $10^2$

$$\frac{1}{10} \times \frac{1000}{10^{-3}}$$

$$10^{-4} \times \frac{1}{100} \\ 10^{-4} \times 10^{-2}$$

Sep 28-9:04 AM

Divide. Write each answer in exponential form.

13.)  $\frac{10^6}{10^3}$  \_\_\_\_\_

17.)  $\frac{10^9}{10^9}$  \_\_\_\_\_

$$14.) \frac{1}{100,000} = 10^{-5} \quad \frac{1}{1000} = 10^{-3} \quad \frac{10^{-2}}{10^{-3}} = 10^1$$

$$18.) \frac{0.001 \times 10,000}{10^{-3} \times 10^4} = \frac{10^{-3} \times 10^4}{10^{-3} \times 10^4} = 10^{-7}$$

15.)  $\frac{10^{-3}}{10,000}$  \_\_\_\_\_

19.)  $\frac{10}{0.01}$  \_\_\_\_\_

16.)  $\frac{10^2}{10^{-4}}$  \_\_\_\_\_

20.)  $\frac{10^9}{10^{-9}}$  \_\_\_\_\_

Sep 28-9:04 AM

Name: \_\_\_\_\_

Notes: Scientific Notation

Standard Form: numerical answer

Example:

3,240,000,000.00000019

Scientific Notation:

Writing #'s for science - using  $10^{\text{powers}}$ 

Example:

 $3.24 \times 10^8$  $1.9 \times 10^{-6}$ 

Sep 28-9:04 AM

**\*Remember Powers of 10\***

How to write an integer in Scientific Notation:

Step 1: Start with a number in Standard Form.

Step 2: Move the decimal place to the *left* to rewrite it as a number between 1 and 10. *bigger than 1.0 and less than 10  
9.9 or Below*Step 3: Determine the exponent, which is the number of times you have moved the decimal. This will be your exponent on 10. Because you have moved the decimal to the left, it will be a **positive** exponent.Step 4: Write your number in this form:  $N \times 10^p$ 

(where N is the decimal between 1 and 10 and p is your exponent)

Sep 28-9:04 AM

Example 1

Step 1: 32

Step 2: 3.2

Step 3: moved 1 place to the left  $\rightarrow 10^1$ Step 4:  $3.2 \times 10^1$ 

Sep 28-9:04 AM

Example 2:

Step 1: 456.

Step 2: 4.56

Step 3: 2 places left  $\rightarrow 10^2$ Step 4:  $4.56 \times 10^2$ 

Sep 28-9:04 AM

How to write a decimal number in Scientific Notation:

Step 1: Start with a number in Standard Form.

Step 2: Move the decimal place to the **right** to rewrite it as a number between 1 and 10.

Step 3: Determine the exponent, which is the number of times you have moved the decimal. This will be your exponent on 10. Because you have moved the decimal to the right, it will be a **negative exponent**.

Step 4: Write your number in this form:  $N \times 10^{-p}$   
(where N is the decimal between 1 and 10 and -p is your exponent)

Sep 28-9:05 AM

Example 3:

Step 1: 0.009

Step 2: 9

Step 3: 3 places right  $\rightarrow 10^{-3}$ Step 4:  $9 \times 10^{-3}$ 

Sep 28-9:05 AM

Example 4:Step 1: 0.082Step 2: 8.2Step 3: 2 places right  $\rightarrow 10^{-2}$ Step 4:  $8.2 \times 10^{-2}$ 

Sep 28-9:05 AM

Write the following in Scientific Notation:

1. 3 =  $3 \times 10^0$

2. 400 =  $4 \times 10^{-2}$  2 places left +

3. 27 =  $2.7 \times 10^1$

4. 35 =  $3.5 \times 10^1$

5. 625 =  $6.25 \times 10^2$

6. 1892 =  $1.892 \times 10^3$

Sep 28-9:06 AM

5.  $625 = \underline{\quad} \times 10$

6.  $1892 = \underline{\quad} \times 10$

7.  $0.12 = \underline{1.2} \times 10^{-1}$

8.  $0.045 = \underline{4.5} \times 10^{-2}$

9.  $0.0079 = \underline{7.9} \times 10^{-3}$

10.  $0.00064 = \underline{6.4} \times 10^{-4}$

Sep 28-9:06 AM

Name: \_\_\_\_\_

## Practice: Scientific Notation

Write the following in Scientific Notation:

1.  $34 = \underline{3.4} \times 10^1$

2.  $273 =$

3.  $4,309 = \underline{4.309} \times 10^3$

4.  $32,098 =$

5.  $112 = \underline{1.12} \times 10^2$

6.  $7,965,043 =$

7.  $13 = \underline{1.3} \times 10^1$

8.  $845,092 =$

9.  $0.05982 = \underline{5.982} \times 10^{-2}$

10.  $0.009 =$

11.  $0.54 = \underline{5.4} \times 10^{-1}$

12.  $0.00034 =$

Sep 28-9:06 AM

Write the following in Standard Form:

13.  $6.282 \times 10^4$  = right  $6,282,000$

left

14.  $2.3 \times 10^{-3}$  =  $.0023$

15.  $1.16 \times 10^2$  =

16.  $5.39 \times 10^6$  =

17.  $7.4236 \times 10^{-2}$  =

18.  $4.3 \times 10^{-2}$  =  $.043$

19.  $8.89 \times 10^5$  =

20.  $9.834 \times 10^{-4}$  =

Sep 28-9:07 AM

21. A CD can store about 650,000,000 bytes of data. Write this number in scientific notation.

22. There are 5,280 feet in one mile. Write this number in scientific notation.

23. The speed of light is about  $1.86 \times 10^5$  miles per second. Write this number in standard form.

24. The diameter of the Sun is about  $1.39 \times 10^9$  meters. Write this number in standard form.

Sep 28-9:07 AM

Scientific Notation  
Notes  
Examples

**Part I**

Write each number in scientific notation.

- 1) 7,450
- 2) 103,400
- 3) 2,450,000
- 4) .00914
- 5) .000451
- 6) .0000002846

Sep 28-9:07 AM

**Part II**

Write each number in standard form.

- 1)  $8.1 \times 10^2$
- 2)  $9.03 \times 10^5$
- 3)  $1.003 \times 10^8$
- 4)  $5.23 \times 10^{-3}$
- 5)  $3.916 \times 10^{-4}$
- 6)  $7.71 \times 10^{-6}$

Sep 28-9:07 AM

## Warm-Up Activity

Name \_\_\_\_\_ Date \_\_\_\_\_

## Concept: Understanding Components of Scientific Notation



Directions: The following activity is designed to review writing very large or very small numbers in a more precise form known as scientific notation. For starters, a review of powers of 10 is necessary. Work with a partner to investigate positive and negative integer exponents. Then, relocate the decimal point in preparation for writing in scientific notation.

1. Powers of 10 Use a calculator and write each power as a rational number.

$$\begin{array}{ccccccc} 10^1 & 10^2 & 10^3 & 10^4 & 10^5 & 10^6 \\ \underline{10} & \underline{100} & \underline{1000} & \underline{10000} & \underline{100,000} & \underline{1,000,000} \end{array}$$

$$\begin{array}{ccccccc} 10^{-1} & 10^{-2} & 10^{-3} & 10^{-4} & 10^{-5} & 10^{-6} \\ \underline{\frac{1}{10}} & \underline{\frac{1}{100} = \frac{1}{100}} & \underline{\frac{1}{1000} = \frac{1}{1000}} & \underline{\frac{1}{10000} = \frac{1}{10000}} & \underline{\frac{1}{100000} = \frac{1}{100000}} & \underline{\frac{1}{1000000} = \frac{1}{1000000}} & \underline{\frac{1}{10000000} = \frac{1}{10000000}} \end{array}$$

Oct 1-10:45 AM

What does it mean to have a positive exponent?

Large #

How are negative exponents used?

small #, decimals  
fractions

2. Relocation of the Decimal Point Relocate the decimal point so that the new number lies between 1 and 10. less than 10

- 1) 34.63      2) 0.00257      3) 0.000056      4) 656,000,000,000

$$\begin{array}{cccc} \underline{3.463} & \underline{2.57} & \underline{5.6} & \underline{6.56} \end{array}$$

3. Scientific Notation Use the answers to Part 2 and write each number in scientific notation.

- 1) ~~34.63~~      2) ~~0.00257~~      3) ~~0.000056~~      4) ~~656,000,000,000~~

$$\begin{array}{cccc} \underline{3.463 \times 10^1} & \underline{2.57 \times 10^{-3}} & \underline{5.6 \times 10^{-5}} & \underline{6.56 \times 10^{11}} \end{array}$$

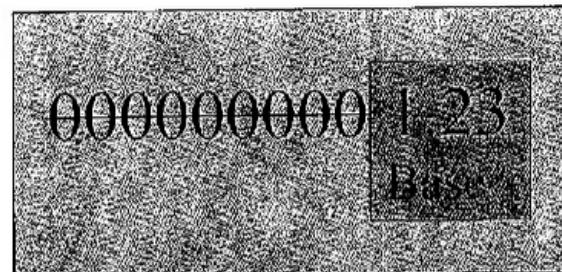
Oct 1-10:45 AM

## HOW TO WRITE SMALL NUMBERS IN SCIENTIFIC NOTATION

To write the number .00000000123 in *scientific notation*:

To determine the base, put the decimal after the first non-zero digit and drop the zeros.

$$\begin{array}{l} \text{Base} \times 10^{\text{exponent}} \\ 1.23 \times 10^{-9} \end{array}$$

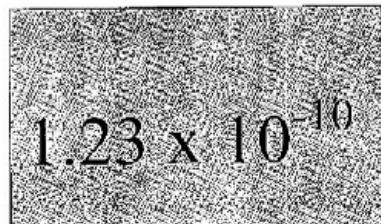


In the number .00000000123, the base number will be 1.23.

Oct 1-11:55 AM

To find the exponent count the number of places from the decimal in the base number to the decimal in the original number.

In .00000000123, there are 10 places counted to the left of the decimal in the base number. Therefore, we write .00000000123 in scientific notation as



?)

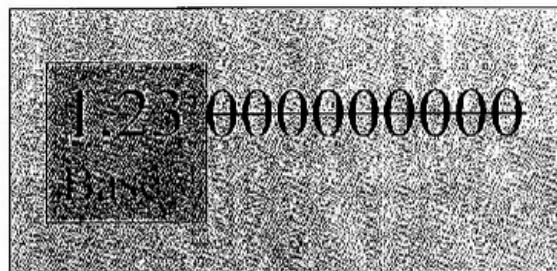
Oct 1-11:55 AM

## HOW TO WRITE LARGE NUMBERS IN SCIENTIFIC NOTATION

To write the number 123,000,000,000 in scientific notation:

To determine the base, put the decimal after the first non-zero digit and drop the zeros.

$$\begin{array}{l} \text{base} \\ 1.23 \times 10^{11} \end{array}$$

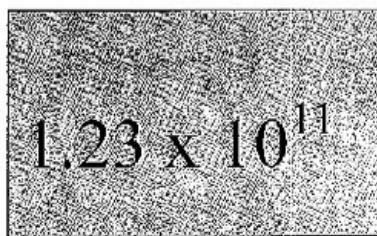


In the number 123,000,000,000 the base number will be 1.23.

To find the exponent count the number of places from the decimal in the base number to the end of the original number.

Oct 1-10:46 AM

In 123,000,000,000, there are 11 places counted to the right of the decimal in the base number. Therefore, we write 123,000,000,000 in scientific notation as



(3)

Oct 1-10:47 AM

## Scientific Notation

Scientific Notation

Scientists need to express small measurements, such as the mass of the proton at the center of a hydrogen atom ( $0.000\ 000\ 000\ 000\ 000\ 000\ 000\ 001\ 673$  kg), and large measurements, such as the temperature at the center of the Sun (15 000 000 K). To do this conveniently, they express the numerical values of small and large measurements in scientific notation, which has two parts.

A number in which  
only one digit is  
placed to the left  
of the decimal

$$N \times 10^n$$

An exponent  
of 10 by which  
the number is  
multiplied

Thus, the temperature of the Sun, 15 million kelvins, is written as  $1.5 \times 10^7$  K in scientific notation.

Oct 1-11:54 AM

**Positive Exponents** Express 1234.56 in scientific notation.

1234.56

Each time  
the decimal  
place is  
moved one  
place to the  
left,

$$1234.56 \times 10^0 = 123.456 \times 10^1$$

$$123.456 \times 10^1 = 12.3456 \times 10^2$$

$$12.3456 \times 10^2 = 1.234\ 56 \times 10^3$$

$$1.234\ 56 \times 10^3$$

the  
exponent is  
increased by  
one.

Oct 1-11:54 AM

**Negative Exponents** Express 0.006 57 in scientific notation.

0.006 57

Each time  
the decimal  
place is  
moved one  
place to the  
right,

$$0.006\ 57 \times 10^0 = 0.0657 \times 10^{-1}$$

$$0.0657 \times 10^{-1} = 0.657 \times 10^{-2}$$

$$0.657 \times 10^{-2} = 6.57 \times 10^{-3}$$

$$6.57 \times 10^{-3}$$

the  
exponent is  
decreased  
by one.

Oct 1-11:54 AM

### MATH HANDBOOK TRANSPARENCY WORKSHEET

#### Scientific Notation

Use with Appendix B,  
Scientific Notation

1. Express each of the following numbers in scientific notation.

a. 230  $2.3 \times 10^2$

b. 5601  $5.601 \times 10^3$

c. 1400000  $1.4 \times 10^7$

d. 56 million  $5.6 \times 10^7$

e. 2/10  $2 \times 10^{-1}$

f. 0.450 13  $4.5013 \times 10^{-1}$

g. 0.089  $8.9 \times 10^{-2}$

Oct 1-10:47 AM

h. 0.000 26

$$2.6 \times 10^{-4}$$

i. 0.000 000 698

$$6.98 \times 10^{-7}$$

j. 12 thousandths

0.012

$$1.2 \times 10^{-2}$$

2. Express each of the following measurements in scientific notation.

a. speed of light in a vacuum, 299 792 458 m/s

$$2.99792458 \times 10^8$$

b. number of seconds in a day, 86 400 s

$$8.64 \times 10^4$$

c. mean radius of Earth, 6378 km

$$6.378 \times 10^3$$

d. density of oxygen gas at 0°C and pressure of 101 kPa, 0.001 42 g/mL

$$1.42 \times 10^{-3}$$

e. radius of an argon atom, 0.000 000 008 m

$$9.8 \times 10^{-11}$$

Oct 1-10:47 AM

F

## SCIENTIFIC NOTATION

Name \_\_\_\_\_

Scientists very often deal with very small and very large numbers, which can lead to a ~~lot~~ of confusion when counting zeros! We have learned to express these numbers as powers of 10.

Scientific notation takes the form of  $M \times 10^n$  where  $1 \leq M < 10$  and "n" represents the number of decimal places to be moved. Positive n indicates the standard form is a large number. Negative n indicates a number between zero and one.

**Example 1:** Convert 1,500,000 to scientific notation.

We move the decimal point so that there is only one digit to its left, a total of 6 places.

$$1,500,000 = 1.5 \times 10^6$$

**Example 2:** Convert 0.000025 to scientific notation.

For this, we move the decimal point 5 places to the right.

$$0.000025 = 2.5 \times 10^{-5}$$

(Note that when a number starts out less than one, the exponent is always negative.)

Convert the following to scientific notation.

Oct 1-11:53 AM

Convert the following to scientific notation.

1.  $0.005 = \underline{5 \times 10^{-3}}$
2.  $5,050 = \underline{5.050 \times 10^3}$
3.  $0.0008 = \underline{8 \times 10^{-4}}$
4.  $1,000 = \underline{1 \times 10^3}$
5.  $1,000,000 = \underline{1 \times 10^6}$

6.  $0.25 = \underline{2.5 \times 10^{-1}}$
7.  $0.025 = \underline{2.5 \times 10^{-2}}$
8.  $0.0025 = \underline{2.5 \times 10^{-3}}$
9.  $500 = \underline{5 \times 10^2}$
10.  $5,000 = \underline{5 \times 10^3}$

Convert the following to standard notation.

1.  $1.5 \times 10^3 = \underline{1500}$
2.  $1.5 \times 10^{-3} = \underline{.0015}$
3.  $3.75 \times 10^{-2} = \underline{.0375}$
4.  $3.75 \times 10^2 = \underline{375}$
5.  $2.2 \times 10^5 = \underline{220,000}$

6.  $3.35 \times 10^{-1} = \underline{-335}$
7.  $1.2 \times 10^{-4} = \underline{.00012}$
8.  $1 \times 10^4 = \underline{10000}$
9.  $1 \times 10^{-1} = \underline{.1}$
10.  $4 \times 10^0 = \underline{4}$

Oct 1-11:53 AM

Before you begin this lesson on scientific notation, write the correct answer for each problem.

1. What is  $2.8 \times 10^4$  written in standard notation?

- A. 28,000
- B. 2,800
- C. 0.00028
- D. 0.000028

2. What is  $3.4 \times 10^{-3}$  written in standard notation?

- A. 0.000034
- B. 0.000034
- C. 0.00034
- D. 0.0034

Oct 1-10:48 AM

3. What is 594,000,000 written in scientific notation?
- A  $5.94 \times 10^9$
  - B  $5.94 \times 10^8$
  - C  $5.94 \times 10^7$
  - D  $5.94 \times 10^6$

Oct 1-10:48 AM

4. Which is equal to  $(2.4 \times 10^3) \times (1.2 \times 10^4)$ ?

- A  $2.88 \times 10^6$
- B  $3.6 \times 10^6$
- C  $2.88 \times 10^8$
- D  $3.6 \times 10^8$

5. Which is equal to  $\frac{4.4 \times 10^6}{1.1 \times 10^2}$ ?

- A  $3.3 \times 10^4$
- B  $4.0 \times 10^4$
- C  $3.3 \times 10^6$
- D  $4.0 \times 10^6$

6. The speed of light is  $1.86 \times 10^5$  miles per second. Using a year of 365 days, how far does light travel in a year?

- A  $6.79 \times 10^7$
- B  $5.26 \times 10^{10}$
- C  $5.87 \times 10^{12}$
- D  $6.87 \times 10^{12}$

p. 7

Oct 1-10:48 AM

Name \_\_\_\_\_ Date \_\_\_\_\_

Write each number in standard format.

$$3.443 \times 10^{-7} = \underline{\hspace{10cm}} .0000003443$$

$$7.75763 \times 10^{-7} = \underline{\hspace{10cm}} .000000775763$$

$$5.8 \times 10^{-7} = \underline{\hspace{10cm}} .00000058$$

$$1.525 \times 10^6 = \underline{\hspace{10cm}} 1525000.$$

$$6.58157 \times 10^7 = \underline{\hspace{10cm}} 65,815,700$$

Oct 1-10:51 AM

$$\textcircled{5} 5.1821 \times 10^{-4} = \underline{\hspace{10cm}} .00051821$$

$$\textcircled{1} 21 \times 10^{-7} = \underline{\hspace{10cm}} .000000121$$

$$5.2314 \times 10^{-7} = \underline{\hspace{10cm}} .00000052314$$

$$7.141 \times 10^{-5} = \underline{\hspace{10cm}} .00007141$$

$$5.256 \times 10^6 = \underline{\hspace{10cm}} 5,256,000$$

(3)

Oct 1-10:51 AM

p. 9

Write each number in scientific notation.

$$\underline{0.07882} = \underline{7.882 \times 10^{-2}}$$

$$\underline{0.00000272338} = \underline{2.72338 \times 10^{-6}}$$

$$\underline{118000} = \underline{1.18 \times 10^5}$$

$$\underline{87200} = \underline{8.72 \times 10^4}$$

$$\underline{0.00002786} = \underline{2.786 \times 10^{-5}}$$

$$\underline{0.000000664} = \underline{6.64 \times 10^{-7}}$$

Oct 1-10:48 AM

$$\underline{450} = \underline{4.5 \times 10^2}$$

$$\underline{741717} = \underline{7.41717 \times 10^4}$$

$$\underline{770} = \underline{7.7 \times 10^2}$$

$$\underline{0.0000085} = \underline{8.5 \times 10^{-6}}$$

Oct 1-10:48 AM

## Practice

Circle the letter of the best answer.

1. Mars is about 141,600,000 mi from the Sun. What is this number of miles written in scientific notation?

A  $1.416 \times 10^5$  C  $1.416 \times 10^7$   
 B  $1.416 \times 10^6$  D  $1.416 \times 10^8$

2. A foot is equal to  $1.5 \times 10^{-2}$  chains. In decimal form, how many chains are equal to one foot?

F 0.0015 H 0.15  
 G 0.015 J 150

3. The 2005–2006 Broadway season brought an all-time high attendance of  $1.2 \times 10^7$  people. What was the attendance, in standard form, for the 2005–2006 Broadway season?

A 120,000 C 12,000,000  
 B 1,200,000 D 120,000,000

6. Which of these numbers has the greatest value?

F  $4.21 \times 10^{-3}$  H  $5.08 \times 10^{-4}$   
 G  $3.16 \times 10^{-3}$  J  $2.36 \times 10^{-3}$

7. An angstrom is a measure of length equal to  $4 \times 10^{-9}$  in. In inches, what is the measure of an angstrom in standard form?

A 0.000000004 C 0.000004  
 B 0.000000004 D 0.000004

8. Which of these countries has the least population?

F Bangladesh,  $1.474 \times 10^8$   
 G China,  $1.313 \times 10^9$   
 H India,  $1.112 \times 10^9$   
 J United States,  $2.98 \times 10^8$

Oct 1-10:50 AM

4. What is 0.002702 written in scientific notation?

F  $2.702 \times 10^{-6}$  H  $2.702 \times 10^{-4}$   
 G  $2.702 \times 10^{-5}$  J  $2.702 \times 10^{-3}$

5. New Croton Dam has a capacity of 71,900,000 m<sup>3</sup>. What is this number of cubic meters written in scientific notation?

A  $7.19 \times 10^7$  C  $7.19 \times 10^9$   
 B  $7.19 \times 10^8$  D  $7.19 \times 10^{10}$

9. The ladybug has a length of between 0.038 in. and 0.41 in. What are these values in scientific notation?

A  $3.8 \times 10^{-3}$  and  $4.1 \times 10^{-2}$   
 B  $3.8 \times 10^{-2}$  and  $4.1 \times 10^{-1}$   
 C  $3.8 \times 10^{-2}$  and  $4.1 \times 10^{-2}$   
 D  $3.8 \times 10^{-3}$  and  $4.1 \times 10^{-1}$

(10)

Oct 1-10:50 AM

$$\cancel{PS \neq 4}$$

(1-5)  $P_{n+1}$

Ex

$$-2 + 4 = 2$$

(-) (+) + +

|

6 - 10

Ex multiply  $(2x^2)(-3x)$

$(2)x \cdot x (-3) \cdot x$

$-6x^3$

Oct 2-12:45 PM

Oct 2-12:51 PM