Measurement Skills Review

September 5, 2018 9:19 PM

Math 10 – Measurement

Name: _____
Date: _____

Lesson 1.0 – Skills Review

Rounding

Take a minute to look at the place value chart:

	hundred millions	ten millions	millions	hundred thousands	ten thousands	thousands	hundreds	tens	units (ones)	decimal	tenths	hundredths	thousandths	ten thousandths	hundred thousandths	millionths	ten millionths	hundred millionths
ex	1	3	8	2	7	6	5	5	9	.	0	0	1	5	8	7	6	2

Place values show us what each number is worth: a 3 in the tens spot means you have 3 tens, or 30. A 5 in the tenths position means there are 5 tenths, or 5/10 (0.5). zeros are used to fill spaces between the digits we have and the decimal place, both before and after the decimal. Notice that going up from zero we have units (ones), tens, hundreds... going down from the decimal there is no "units" place, and all the places end with "ths": tenths, hundredths, thousandths.

0.5
0.05
"place holder" zero

Example 1: In the number 63,407,218; find the place value of each of the following digits:

a) 7 thousands
b) 0 ten thousands
c) 1 tens
d) 6 ten millions
e) 3 million

63, 407, 218.00

The Rounding Golden Rule:

- If the number to the right of the number in the desired location is LESS THAN 5, then THE NUMBER STAYS THE SAME.
- If the number to the right of the number in the desired location is 5 OR MORE, then THE NUMBER ROUNDS UP.

ex. 4327.6 look to right

do I round?

1 2 3 4 < 5 6 7 8 9

stay the same round up.

round to the ...

round to the ...

1st decimal 2nd decimal

Example 2: Complete the following table:

Round to the Nearest..	One	Ten	Hundred	Tenth	Hundreth
① 538.5968	538.5968 → 539	538.5968 → 540	500	538.6	538.5968 → 538.60
Try This ② 10 964.893	10 965	10 960	11 000	10 964.9	10 964.89

↑ round

Standard Notation vs. Scientific Notation

"M"

in front of decimal must be 1 → 9

≠ 0

≠ 10+

Standard Notation	Scientific Notation
150 000 000	1.5×10^{8}

"n"

At least one but less then ten

power of 10

In other words, $M \times 10^{n}$ is the proper form of numbers that are expressed in scientific notation, where $1 \leq M < 10$ and n is an integer {...-3,-2,-1,0,1,2,3...}

For Example:

Conversion Steps:

1. ***Find M.*** Place a decimal such that $1 \leq M < 10$.

2. ***Find n.*** Count the # of places you moved the decimal. *If the number you are converting is less than 1, then n is (-). If it is greater than 1, n is (+).*

Example 3: Express each number in scientific notation to the nearest tenth. (2 dec. places)

a) 75 300 000. ← 7 places ∴ n = 7

M = 7.53

n = 7

7.5×10^{7}

start with number > 1 = (+) post. exponent

b) 0.000 038 92

5 places ∴ n = 5

M = 3.892

$= 3.9 \times 10^{-5}$

neg. exponent start with small # (decimal) < 1

EE = $\times 10^{?}$ * use brackets on calc * e^x = $\times 10^{?}$

Example #4: In each case, perform the calculation and give the answer in scientific notation to one decimal place.

(4.35 EE 2)(5.13 EE -6)

a) $(4.35 \times 10^{2})(5.13 \times 10^{-6})$ b) $\dfrac{(8.64 \times 10^{-2})}{(5.18 \times 10^{-10})}$ c) $79.308 \times 34.602\ 1$

$= 0.00223155$

$= 2.2 \times 10^{-3}$

$22.3155^{2+(-6)}$

22.3155^{-4} $\times 10^{-3}$

$= 1667953668$

$= 1.7 \times 10^{8}$

$1.7^{-2-(-10)=8}$ $\times 10$

$= 2744.22\ldots$

$= 2.7 \times 10^{3}$

Practice Work: Skills Review Worksheet #1-7

Thursday HW: Q #1

Substitution in Algebraic Expressions

- When substituting values, *ALWAYS USE BRACKETS*
- *WHY?* keep track of +/- signs

Example 5: Find the value of each of the following if $x = 2$ and $y = -3$.

a) $y^2 - 7x - 3$

$(-3)^2 - 7(2) - 3$

$9 - 14 - 3$

$= -8$

b) $9x^2 - y + y^3$

$9(2)^2 - (-3) + (-3)^3$

$9(4) + 3 + (-27)$

$36 + 3 - 27$

$= 12$

Brackets
Exponents
Divide
Multiply
Add
Subtract

Substitution into Formulae

isolate r

Example 6:

i) solve for the variable indicated, then
ii) substitute the given value and answer to the nearest tenth where necessary.

a) If $S = \frac{\pi r}{4}$, solve for r and calculate the value of r when $S = 75$.

$S = \frac{\pi r}{4} \times 4 \rightarrow 4S = \pi r \rightarrow \frac{4S}{\pi} = \frac{\pi r}{\pi} \rightarrow \frac{4S}{\pi} = r$

$\frac{4(75)}{\pi} = r$

$\therefore r = 95.5$

b) If $A = \pi r^2$, solve for r and calculate the value of r when $A = 72$.

$\frac{A}{\pi} = \frac{\pi r^2}{\pi} \rightarrow \sqrt{\frac{A}{\pi}} = \sqrt{r^2}$

$\therefore r = \sqrt{\frac{A}{\pi}}$

$r = \sqrt{\frac{(72)}{\pi}} = 4.78\ldots$

4.8

Math Tips
Multiplying "undoes" dividing

Dividing "undoes" multiplying

Avoid creating "complex fractions" (fractions inside fractions)

Use π button on calculator, not 3.14

Practice Work: Skills Review Worksheet #8-11