OCTOBER 15, 2015

UNIT 2:   POWERS AND EXPONENT LAWS

**SECTION 2.2:
POWERS OF 10 AND THE
ZERO EXPONENT**

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MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Numbers 1" OR "N1" which states:

"Demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by: representing repeated multiplication using powers; using patterns to show that a power with an exponent of zero is equal to one; solving problems involving powers."

What does THAT mean???

SCO N1 means that we will learn about the two parts of a power (the base, or "the big number", and the exponent, or "the little number"). We will show what a power means when we write it out using multiplication (ex: $3^2 = 3 \times 3$), and we will use patterns to prove, for example, that $3^0 = 1$. Finally, we will use what we know about powers to solve problems.

HOMEWORK QUESTIONS?
(pages 56 / 57, #14, #20 and #21a;
"Extra Practice 2.1")

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SECTION 2.2: POWERS OF 10 AND THE ZERO EXPONENT

Please copy and complete the following table:

EXPONENT	POWER (use a base of 2)	STANDARD FORM
5	2^5 $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$	32
4	2^4 $2 \cdot 2 \cdot 2 \cdot 2$	16
3	2^3 $2 \cdot 2 \cdot 2$	8
2	2^2 $2 \cdot 2$	4
1	2^1 2	2
0	2^0	1
−1	2^{-1}	$\frac{1}{2}$
−2	2^{-2}	$\frac{1}{4}$

$2^{-2} = \left(\frac{1}{2}\right)^2$

$\div 2$ (each step down)

Please copy and complete the following table:

EXPONENT	POWER [use a base of (-5)]	STANDARD FORM	
5	$(-5)^5$	-3125	$\div (-5)$
4	$(-5)^4$	625	$\div (-5)$
3	$(-5)^3$	-125	$\div (-5)$
2	$(-5)^2$	25	$\div (-5)$
1	(-5)	-5	$\div (-5)$
0	$(-5)^0$	1	

UNIT 2, 2nd PAGE: "EXPONENT LAWS"

1. **ZERO EXPONENT LAW**: A power with an
          integer base (other than 0) and an
          exponent of 0 is equal to 1. We
          express this law as: $a^0 = 1$; $a \neq 0$.
          Ex.: 2^0 = 1
                  3^0 = 1
                  $(-5)^0$ = 1
                  -4^0 = -1

PLEASE TURN TO PAGE 59 IN *MMS9*. LOOK AT EXAMPLE 1 - *EVALUATING POWERS WITH EXPONENT ZERO.*

Evaluate each expression:

1. 13^0 = 1 **2. $(-15)^0$ =** 1

3. -7^0 = -1 **4. $-(-8^0)$ =** $-(-1)$
$= 1$

5. $[-2^2 + 3^3 \times (-5)^5 \div (-10)^8]^0$ $= 1$

PLEASE TURN TO PAGE 60 IN *MMS9*. LOOK AT EXAMPLE 2 - *WRITING NUMBERS USING POWERS OF TEN*.

Write the following numbers using powers of 10:

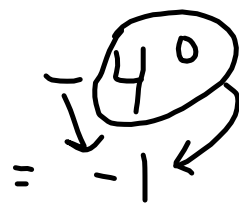1. $8\,678 = (8 \times 10^3) + (6 \times 10^2) + (7 \times 10) + (8 \times 10^0)$

2. $12\,935 = (1 \times 10^4) + (2 \times 10^3) + (9 \times 10^2) + (3 \times 10) + (5 \times 10^0)$

3. $403 = (4 \times 10^2) + (3 \times 10^0)$

PLEASE TURN TO PAGE 61 IN *MMS9.*

"Discuss the Ideas":

1. 4^0 $(-4)^0$ -4^0

   $= 1$ $= 1$ $= -1$

CONCEPT REINFORCEMENT:

MMS9:
PAGE 61:   **#4 TO #11**
PAGE 62:   **"Math Link" - OPTIONAL BONUS ASSIGNMENT!**
                    (Show ALL work on a separate sheet of loose-leaf to be passed in at the BEGINNING of class Friday, Oct. 16. Don't forget to put your name on your paper!)