

OCTOBER 9, 2019

UNIT 2: POWERS AND EXPONENT LAWS

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

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MATH 9



Oct 1-9:44 AM

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."

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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.



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WARM UP:

Evaluate each expression.

i) -3^2 ii) $-(3)^2$ iii) $-(-3)^2$ iv) $(-3)^2$

-9 -9 -9 9

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HOMEWORK QUESTIONS?

(Pages 56 / 57, #14, 16, 18, 19, 20, 21a and "Extra Practice 1" Worksheet, #1 TO #9ac)

9. Stamps

$$a) 10 \times 10 = 100 \text{ stamps}$$

$$10^2$$

$$c) \frac{\$60}{100} = \$0.60/\text{stamp}$$

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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	32
4	2^4	16
3	2^3	8
2	2^2	4
1	2^1	2
0	2^0	1

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Please copy and complete the following table:

EXPONENT	POWER (use a base of 3)	STANDARD FORM
5	3^5	243
4	3^4	81
3	3^3	27
2	3^2	9
1	3^1	3
	3^0	1

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Please copy and complete the following table:

EXPONENT	POWER [use a base of (-5)]	STANDARD FORM
5	$(-5)^5$	
4		
3		
2		
1		

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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.: $2^0 = 1$

$3^0 = 1$

$(-5)^0 = 1$

$-4^0 = -1$

$(\text{Austin})^0 = 1$

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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. $-(-8^0) = 1$

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

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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:

$$8000 + 600 + 70 + 8$$

1. **8 678** = $8 \times 1000 + 6 \times 100 + 7 \times 10 + 8 \times 1$
standard form = $8 \times 10^3 + 6 \times 10^2 + 7 \times 10^1 + 8 \times 10^0$

2. **12 935** = $1 \times 10\,000 + 2 \times 1000 + 9 \times 100 + 3 \times 10 + 5 \times 1$
 = $1 \times 10^4 + 2 \times 10^3 + 9 \times 10^2 + 3 \times 10^1 + 5 \times 10^0$

3. **403** = $4 \times 100 + 3 \times 1$
 $4 \times 10^2 + 3 \times 10^0$

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$$7 \times 10^3 + 8 \times 10^1 + 2 \times 10^0$$

$$\left(\begin{array}{l} 7 \times 1000 + 8 \times 10 + 2 \times 1 \\ \rightarrow 7000 + 80 + 2 \\ 7082 \end{array} \right.$$

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CONCEPT REINFORCEMENT:**MMS9:****PAGE 61: #4, 5, 6, 7, 8, 9, 10, 11, and 12**

Standard form $7 \times 10^7 = 70\,000\,000$

10 b) $3 \times 10^4 + 9 \times 10^3 + 5 \times 10^1 + 7 \times 10^0$

10^4	10^3	10^2	10^1	10^0
3	9	0	5	7

c) $8 \times 10^8 + 5 \times 10^5 + 2 \times 10^2$

10^8	10^7	10^6	10^5	10^4	10^3	10^2	10^1	10^0
8	0	0	5	0	0	2	0	0

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