Unit 3: Exponents Practice Test

Math 9 Principles

Name: _____ Block: ____

Please initial this box to indicate you carefully read over your test and checked your work for simple mistakes.

	What I can do in this unit	Level
3-1	I can convert powers between exponential form, expanded form, and standard form and evaluate using integer, fractions, and decimal bases.	
3-2	I can use the exponent laws for products and quotients. (add exponents for products of same bases, subtract for quotients).	
3-3	I can use the power of a power exponent law and apply it to coefficients and variables. (multiply exponents when taking the power of a power)	
3-4	I can convert a negative power to a positive power and evaluate a zero power with integer and fraction bases.	

Code	Value	Description
N	Not Yet Meeting Expectations	I just don't get it.
MM	Minimally Meeting Expectations	Barely got it, I need some prompting to help solve the question.
M	Meeting Expectations	Got it, I understand the concept without help or prompting.
E	Exceeding Expectations	Wow, nailed it! I can use this concept to solve problems I may have not seen in practice. I also get little details that may not be directly related to this target correct.

3-1: I can convert powers between exponential form, expanded form, and standard form and evaluate using integer, fractions, and decimal bases.

Complete the table:

#	Exponential Form	Expanded Form	Standard Form
1)	2^3		
2)	-3^4		
3)	$(-2)^5$		
4)	x^5		Cannot

Write each of the following in exponential form in as many ways as indicated. Do not use a power of 1.

#	Standard Form	Exponential Form
5)	125	
6)	64	
7)	1 000 000	
8)	$x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x$	

Evaluate each expression

9) $3^4 - 2^3 + 1^{20}$	10) $-5^2 + (-2)^3$
11) $(5 - 20)^0 - (-5)^2$	12) $\left(\frac{1}{2}\right)^3 \div \left(\frac{3}{4}\right)^3$

Rewrite in standard form as a fraction or integer (no decimals)

13) $-(-3)^4$	14) $\left(\frac{5}{3}\right)^4$	15) $\left(-\frac{3}{4}\right)^3$
16) $\left(-1\frac{1}{3}\right)^2$	17) $(0.4)^3$	18) $(1.5)^4$

3-2: I can use the exponent laws for products and quotients.

19) $5^2 \cdot 5^7$	20) $\frac{x^9}{x}$	21) $(-2)^4 \cdot (-2)^3$
22) $\frac{3^6 \cdot 3^2 \cdot 3}{3^3 \cdot 3^4}$	23) $\frac{(-4)^5(-4)^4}{(-4)^6(-4)^3}$	24) $\frac{x^5 \cdot x \cdot x^2}{x^4 \cdot x^7}$

25) Rewrite each number with a base 2, then simplify. $\frac{256 \cdot 1024}{64 \cdot 16}$

26) If a spaceship can travel at a rate of about 10^6 km per second, how long, in seconds, would it take to reach a star that is 10^{15} km away?

27) There are approximately 10^9 grains of sand in one cubic meter of sand. If a beach contains 10^5 cubic meters of sand, how many grains of sand are on the beach?

28) A space probe can travel at 10^{16} km in 10^7 hours. How far can it travel (in km) in 10^{21} hours? (Hint: First convert its speed to km/h.)

3-3: I can use the power of a power exponent law and apply it to coefficients and variables.

29) $(3^5)^2$	30) $(2^4)^5$	31) $(a^7)^3(a^2)^4$
32) $\frac{(3^3)^3(3^6)^2}{(3^4)^2}$	33) $(5x^3)^4$	34) $\frac{(5x^2)^3(5x^3)^7}{(5x^3)^4}$
35) $\frac{(6x^{12})^3}{(6x^6)^2}$	36) $\frac{(256x^5)^4(128x^3)^6}{(1024x^5)^3}$	37) $\frac{(243x^2)^3(81x^6)^4}{(2187x^8)^2}$

3-4: ***I can convert a negative power to a positive power and evaluate a zero power with integer and fraction bases.***

38) 5^{-2}	39) $(-x)^{-17}$	40) -3^{-4}
41) $(2x^3)^0$	42) $27x^0$	43) $-(-4)^{-3}$
44) $(2^{-3})^2 \cdot (2^2)^{-4}$	45) $\frac{1}{3^{-5}} \cdot 3^{-8}$	46) $\frac{(2^3)^{-4} \cdot (2^{-5})^{-2}}{(2^{-3})^3}$