

EXAM REVIEW GRADE 9
Unit 2 – Powers and Exponent Laws

Name: _____ Class: _____

1. Write as a single power.

a) $(-8)^6 \div (-8)^3$

$$(-8)^{6-3}$$

$$(-8)^3$$

b) $(7^3)^2 \times (7)^4$

$$7^6 \times 7^4$$

$$7^{6+4} = 7^{10}$$

2. Evaluate.

a) $3^3 - 4^2$

$$27 - 16 = 11$$

b) $-4^2 + 7^0$

$$-16 + 1 = -15$$

3. Evaluate each of the following.

(A) 4^4

$$= 4 \times 4 \times 4 \times 4$$

$$= 256$$

(B) -4^2

$$= -4 \times 4$$

$$= -16$$

(C) $(-4)^2$

$$(-4) \times (-4)$$

$$= +16$$

(D) $-(-4)^2$

$$= -(-4) \times (-4)$$

$$= -16$$

4. Which statement is true?

(A) $(4^6)^3 = 4^9$ X

(B) $4^6 \times 4^3 = 7^{18}$ X

(C) $4^0 = 0$ X

(D) $\frac{4^6}{4^3} = 4^3$ ✓

5. Complete the table.

Power	Base	Exponent	Repeated Multiplication	Standard Form
-4^6	4	6	$-(4 \times 4 \times 4 \times 4 \times 4 \times 4)$	-4096
$(-\frac{5}{3})^4$	$-\frac{5}{3}$	4	$(-\frac{5}{3})(-\frac{5}{3})(-\frac{5}{3})(-\frac{5}{3})$	$+\frac{625}{81}$

6. Evaluate $(2^3)^2$ and $(2^3)(2^2)$ and explain why they are different.

$(2^3)^2 = 2^6 = 64$ multiply the exponents, then evaluate

$(2^3)(2^2) = 2^{3+2} = 2^5 = 32$. Same base being multiplied means add the exponents, then evaluate.

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7. Evaluate. Show your work.

$$\begin{aligned} \text{a) } & [(4-10)^3 \times 3^5]^0 + (6-2^2) \\ & = 1 + (6-4) \\ & = 1 + 2 \\ & = 3 \end{aligned}$$

$$\begin{aligned} \text{b) } & (4-16 \div 2^3)^4 - (6-3)^2 \\ & (4-16 \div 8)^4 - (3)^2 \\ & (4-2)^4 - 9 \\ & 2^4 - 9 \\ & 16 - 9 = 7 \end{aligned}$$

8. Write as a single power and then evaluate.

$$\begin{aligned} \text{a) } & (5^2 \times 5^8) \div (5^3)^2 \\ & 5^{10} \div 5^6 \\ & 5^4 \\ \hookrightarrow & 5 \times 5 \times 5 \times 5 \\ & = 625 \end{aligned}$$

$$\begin{aligned} \text{b) } & \frac{(-3)^7}{(-3)^2 \times (-3)^3} \\ & \frac{(-3)^7}{(-3)^5} = (-3)^2 \\ \hookrightarrow & (-3) \times (-3) \\ & = 9 \end{aligned}$$

9. Using laws of exponents, simplify and then evaluate:

$$\begin{aligned} & (3^3 \times 3)^2 + [(-2)^5 \div (-2)^2]^3 \\ & (3^4)^2 + [(-2)^3]^3 \\ & 3^8 + (-2)^9 \\ & 6561 + -512 \\ & 6049 \end{aligned}$$

10. Identify and then correct any errors in the student's work below. Explain how you think the errors occurred.

this is not an exponent rule. Must follow BEDMAS.

$$\begin{aligned} & (3^3 + 3^2)^2 \\ & = (3^5)^2 \\ & = 3^{10} \\ & = 59049 \end{aligned}$$

$$\begin{aligned} & (27 + 9)^2 \\ & (36)^2 \\ & = 1296 \end{aligned}$$