

Before we begin the **Next Unit**, are there any questions from last day's work?

Entertainment: pp. 283-285 #15, 17, 9(do #9 last)

Today's Learning Goal(s):

By the end of the class, I will:

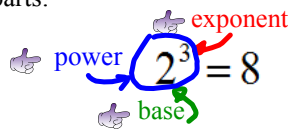
- a) **be ready for tomorrow's unit summative.**
- b) **Review the parts of a power.**
- c) **Review the laws of exponents.**

MBF 3CI

7.1 Exponent Rules

Date: NOV-24/16

Defining the parts:



Note: 2^3 is a single power, or simplified form
 $= 8$ is evaluated form

1. Multiply powers with the same base.

Product	Expanded Form	Number of Factors	Single Power
$5^2 \times 5^4$	$5 \times 5 \times 5 \times 5 \times 5 \times 5$	6	<input type="text"/>
$3^5 \cdot 3^2$	$3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$	7	3^7
$(-2)^5 \times (-2)^2$	$(-2)(-2)(-2)(-2)(-2)(-2)(-2)$	7	$(-2)^7$
$(-3)^4 \times (-3)^3$	$(-3)(-3)(-3)(-3)(-3)(-3)(-3)$	7	$(-3)^7$
$(\frac{1}{2})^3 \times (\frac{1}{2})^1$	$(\frac{1}{2})(\frac{1}{2})(\frac{1}{2})(\frac{1}{2})$	4	$(\frac{1}{2})^4$

Rule 1

To multiply powers with the SAME BASE, keep the SAME BASE,
 and ADD the exponents.

2. Dividing powers with the same base.

Quotient	Expanded Form	Number of Factors Remaining After Simplifying	Single Power
$\frac{5^6}{5^2}$	$\frac{5 \times 5 \times 5 \times 5 \times \cancel{5} \times \cancel{5}}{\cancel{5} \times \cancel{5}}$	4	5^4
$\frac{3^5}{3^3}$	$\frac{\cancel{3} \times \cancel{3} \times 3 \times \cancel{3} \times \cancel{3}}{\cancel{3} \times \cancel{3} \times \cancel{3}}$	2	3^2
$\frac{(-7)^3}{(-7)^2}$	$\frac{(-7) \times \cancel{(-7)} \times \cancel{(-7)}}{\cancel{(-7)} \times \cancel{(-7)}}$	1	$(-7)^1$
$4^7 \div 4^4$	$\frac{4 \cdot 4 \cdot 4 \cdot 4 \cdot \cancel{4} \cdot \cancel{4} \cdot \cancel{4}}{\cancel{4} \cdot \cancel{4} \cdot \cancel{4} \cdot \cancel{4}}$	3	4^3
$\left(\frac{2}{3}\right)^4 \div \left(\frac{2}{3}\right)^3$	$\frac{\left(\frac{2}{3}\right) \times \cancel{\left(\frac{2}{3}\right)} \times \cancel{\left(\frac{2}{3}\right)} \times \cancel{\left(\frac{2}{3}\right)}}{\cancel{\left(\frac{2}{3}\right)} \times \cancel{\left(\frac{2}{3}\right)} \times \cancel{\left(\frac{2}{3}\right)}}$	1	$\frac{2}{3}$

Rule 2

To divide powers with the **SAME BASE**, keep the **SAME BASE**,
and **SUBTRACT** the exponents.

3. Finding the power of a power.

Power of a Power	Expanded Form	Number of Factors of Given Base	Single Power
$(5^3)^2$	$(\quad)(\quad) = (\quad)$	6	(\quad)
$(3^2)^4$	$(3^2)(3^2)(3^2)(3^2) = (3 \times 3)(3 \times 3)(3 \times 3)(3 \times 3)$	8	3^8
$(2^2)^3$	$(2^2)(2^2)(2^2) = (2 \cdot 2)(2 \cdot 2)(2 \cdot 2)$	6	2^6
$(6^5)^2$	$(6^5)(6^5) = (6 \times 6 \times 6 \times 6 \times 6) \times (6 \times 6 \times 6 \times 6 \times 6)$	10	6^{10}
$(4^3)^3$	$(4^3)(4^3)(4^3) = (4 \cdot 4 \cdot 4)(4 \cdot 4 \cdot 4)(4 \cdot 4 \cdot 4)$	9	4^9

Rule 3

To simplify a power of a power, keep the SAME BASE,
and MULTIPLY the exponents.

Summary: The key is to **KEEP THE BASE THE SAME!**

1) $a^m \times a^n$ 👉 $= a^{m+n}$	2) $a^m \div a^n$ $= a^{m-n}$	3) $(a^m)^n$ $= a^{m \times n}$
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Ex.1 Write as a single power (which means simplify), then evaluate.

a) $2^3 \times 2^4$

$$= 2^{3+4}$$

$$= 2^7$$

$$= 128$$

b) $10^{15} \div 10^6$

$$= 10^{15-6}$$

$$= 10^9$$

Simplified = 1 000 000 000 = 5

c) $5^3 \times 5^4 \div 5^6$

$$= 5^{3+4-6}$$

$$= 5^1$$

$$= 5$$

d) $(2^3)^2$

$$= 2^{3 \times 2}$$

$$= 2^6$$

$$= 64$$

Entertainment: p. 360 #1ace,2ace,3ace,4ace,5ace,6,17