

Algebra I  
Section 7-2  
Multiplying Powers with  
the Same Base

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How can we multiply the same base?  
 $a^2 \cdot a^3 = ?$   
 $a \cdot a \cdot a \cdot a \cdot a = a^5$   
 ⇒ by definition of exponents  
 So what is the rule for multiplying the same base? *add the exponents*

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Product-of-Powers Property

For all real numbers  $x$  and all integers  $m$  and  $n$ ,

$x^m \cdot x^n = x^{m+n}$

$3^2 \times 3^3 = 3^5$   
 $6^2 \times 6^1 = 6^3$   
 $j^3 \times j^4 = j^7$   
 $7^a \times 7^b = 7^{a+b}$

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$10^4 + 10^2 \neq 10^6$   
 $10,000 + 100 \neq 1,000,000$   
 Why or why not?  
 No, adding not multiplying the same base

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**Monomial:** an algebraic expression that is either a constant, a variable, or a product of a constant and one or more variables.

The constant is called the **coefficient**.  
 -the coefficients are always simplified using the operation indicated.

Examples:  $4x^2y$ ,  $-12ab^3$ ,  $s^4t^2$ ,  $x$ ,  $2y$ ,  $14$

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Simplify:  $(-2c^2)(3c^3)$

$-6c^{2+3} = -6c^5$

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Simplify →

$$(3m^2)(60mp^2) = 180 m^3 p^2$$

$$(8xz)(-10y)(-2yz^2) = 160xy^2z^3$$

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Simplify:

$$x^{3c} \cdot x^{4c}$$

$$x^{7c}$$

$$(x+c)^d \cdot (x+c)^{2d}$$

$$(x+c)^{3d}$$
~~$$2x+c^2$$~~

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Multiplying with Scientific Notation, put answers into Scientific Notation:

$$(3.02 \times 10^3)(5.005 \times 10^2)$$

To be in Scientific Notation:  
 1. 1st # between 1 and 10  
 2. X  
 3. power of 10

$$15.1151 \times 10^{5+1}$$

$$1.51151 \times 10^6$$

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Exponents can be expressed as fractions. Fractional exponents are called rational exponents.

$$3^2 \text{ means } 3(3) = 9.$$

You can write it as a rational exponent:  
 $9^{1/2} = 3$

In general:  $a^{1/m} = b$  means that b multiplied as a factor m times equals a

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Simplify:

$$16^{1/4} = 2$$

$$2 \cdot 2 \cdot 2 \cdot 2 \quad \textcircled{6}$$

$$27^{1/3} = 3 \quad \checkmark$$

$$3 \cdot 3 \cdot 3 = 27$$

$$64^{1/2} = 8$$

$$8 \cdot 8 = 64$$

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You can also have expressions like  
 $9^{3/2}$  which means  $9^{1/2} \cdot 9^{1/2} \cdot 9^{1/2}$   
 which equals  $3 \cdot 3 \cdot 3 = 27$

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Simplify:

$$25^{\frac{3}{2}}$$

$$25^{\frac{1}{2}} \cdot 25^{\frac{1}{2}} \cdot 25^{\frac{1}{2}}$$

$$5 \cdot 5 \cdot 5 = 125$$

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Hwk: pg. 429-431

#8 -36 evens,

39-41, 44, 48, 52

*Ms. M give us  
a break for  
once  
please:))*

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## Attachments

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Sec8.1(cont)NB.notebook