

## Section 5-1: **Monomials**

### Lesson 15

At the end of this lesson, you should be able to:

- \* Multiply and divide monomials.



## Lesson 15: Monomials Positive Exponents



Exponents are used in algebraic expressions called **monomials**.

A monomial is an expression that is a number, a variable or the product of a number and one or more variables.

Some examples of monomials are:



$$5c, \quad -a, \quad 17, \quad x^3, \quad \frac{1}{2}x^4y^2$$

## Lesson 15: Monomials Positive Exponents

### Definitions

- ~ **Constants:** Monomials that contain no variables.
- ~ **Coefficient:** The number that is multiplied by the variable.



## Rules of Powers

A POWER is an expression in the form of  $x^n$ .

### Multiplying Powers:

For any real number  $a$  and integers  $m$  and  $n$ ,

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

### Dividing Powers:

For any real number  $a$ , except  $a=0$ , and integers  $m$  and  $n$ ,

$$\frac{a^m}{a^n} = a^{m-n}$$

## Properties of Powers

Suppose  $m$  and  $n$  are integers and  $a$  and  $b$  are real numbers. Then the following properties hold.

Power of a Power:  $(a^m)^n = a^{mn}$

Power of a Product:  $(ab)^m = a^m b^m$



## Properties of Powers

Suppose  $m$  and  $n$  are integers and  $a$  and  $b$  are real numbers. Then the following properties hold.

Power of a Quotient:  $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

Zero Exponents:  $\frac{a^m}{a^m} = a^0 = 1$



Lesson 15: Monomials Positive Exponents

**Simplify each expression.**

**Ex 1:**  $(2x^2y^3)(-5x^4y^2)$



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**Simplify.**

**Ex 2:**  $(2ab^2)(-4a^3b^3c)$





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**Simplify.**

**Ex 3:**  $(6a^3b^2)^0$

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**Simplify.**

**Ex 4:**  $(t^3)^4$



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**Simplify.**

**Ex 5:**  $(t^3w^6)^3$

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**Simplify.**

**Ex 6:**  $\frac{p^9}{p^6}$

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**Simplify.**

**Ex 7:**  $\frac{5x^3y^2}{x^3y}$

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**Simplify.**

**Ex 8:**  $\frac{-2c^3d^6}{24c^2d^2}$

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**Simplify.**

**Ex 9:**  $\frac{16}{x^0 + y^0}$

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**Simplify.**

**Ex 10:**  $\left(\frac{-4x^{3n}}{x^{2n}z^2}\right)^3$



Lesson 15: Monomials Positive Exponents

# Assignment 15

Due next class period

