

Chapter 8 § 1

Multiplying Monomials

Definition

Monomial – a number, a variable, or a product of a number and one or more variables.

Constants – monomials that are real numbers.

Examples of Monomials

$$-12$$

$$q$$

$$4x^3$$

$$11ab$$

$$\frac{1}{3}xyz^{12}$$

Examples of Non-Monomials

$$a + b$$

$$\frac{a}{b}$$

$$5 - 7d$$

$$\frac{5}{a^2}$$

$$\frac{5a}{7b}$$

Formulas

Product of Powers - For any number a , and all integers m and n , $(a^m)(a^n) = a^{m+n}$.

Power of a Power - For any number a , and all integers m and n , $(a^m)^n = a^{mn}$.

Power of a Product - For any numbers a and b , and any integer m , $(ab)^m = a^m b^m$.

Power of a Monomial - For any number a and b , and all integers m , n , and p , $(a^m b^n)^p = a^{mp} b^{np}$.

Product of Powers

$$(3a^6)(a^8)$$

$$3a^{14}$$

$$(8y^3)(-3x^2y^2)\left(\frac{3}{8}xy^4\right)$$

$$\left(8 * -3 * \frac{3}{8}\right)(x^2 * x)(y^3 * y^2 * y^4)$$

$$(-9x^3y^9)$$

$$(2a^4)(2a^3b^2)(-3ab^3)$$

$$(-12a^8b^5)$$

Power of a Power

$$(g^3)^4$$

$$g^{(3 \times 4)}$$

$$g^{12}$$

$$(b^4)^5$$

$$b^{20}$$

$$(h^8)^3$$

$$h^{24}$$

Power of a Product

$$(a^2b^3)^4$$

$$a^{(2 \times 4)}b^{(3 \times 4)}$$

$$a^8b^{12}$$

$$(6b^4y)^2$$

$$36b^8y^2$$

$$(5pq^5)^3$$

$$125p^3q^{15}$$

Power of a Monomial

$$[(2a^4b)^3 (-3ab^3)^2]$$

$$[(8a^{12}b^3) (9a^2b^6)]$$

$$72a^{14}b^9$$

$$(2x^4y)^3 [(-2x^3)^2]^2$$

$$(8x^{12}y^3) [(4x^6)]^2$$

$$(8x^{12}y^3) [(16x^{12})]$$

$$128x^{24}y^3$$

$$(x^4y^3z^6)^2 [(2x^2y^2)^2]^4$$

$$(x^8y^6z^{12}) [(4x^4y^4)]^4$$

$$(x^8y^6z^{12}) (256x^{16}y^{16})$$

$$256x^{24}y^{22}z^{12}$$