

Multiplying Monomials

§7.1

Monomial (1 Term) – a number, a variable, or the product of a number and one or more variables with non-negative integer exponents.

ex. $-3, 7x, 5xy^2$

Constant – a monomial that is a real number.

ex. $8, -23$

Determine whether each expression is a monomial.

Example 1

$$15 - c$$

Example 2

$$8f^2g$$

Example 3

$$\frac{3}{4}$$

Example 4

$$\frac{5}{t}$$

Product of Powers - $a^m \cdot a^p = a^{m+p}$

Example 5

$$(2r^4)(-10r^5)$$

Example 6

$$(6c^2d^5)(3cd^7)$$

Power of a Powers - $(a^m)^p = a^{mp}$

Example 7

$$(b^3)^5$$

Example 8

$$\left((3^4)^2\right)^3$$

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

Example 9

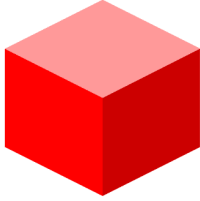
$$(-3x^2y^5z^3)^3$$

Example 10

$$(4x^7y^4z)^2$$

Example 11

Express the volume of a cube with side length $5xy^2z^3$ as a monomial.



Example 12

Simplify $\left[(4a^2b^3c^4)^2\right](2ac^3)^3$

Pg 404, 21-59,73 odds



Dividing Monomials
§7.2

$$\frac{x^5}{x^2} =$$

Quotient of Powers - $\frac{a^m}{a^n} = a^{m-n}$

Example 1

$$\frac{x^7 y^{12}}{x^6 y^3}$$

Example 2

$$\frac{a^8 b^4 c^5}{a^3 b^4 c^2}$$

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

Example 3

$$\left(\frac{3c^7 d^2}{5}\right)^3$$

Example 4

$$\left(\frac{2x^5}{5y^3}\right)^3$$

$$\frac{x^5}{x^5} =$$

Example 5

$$(-2x)^0$$

Example 6

$$\frac{m^0 n^5}{n^2}$$

$$\frac{x^3}{x^7} =$$

Negative Exponents - $a^{-n} = \frac{1}{a^n}$

Switch Location

Example 7

$$\frac{x^{-4} y^9}{z^{-6}}$$

Example 8

$$\frac{75p^3 m^{-5}}{15p^5 m^{-4} r^{-8}}$$

Pg 413, 19-41, 45-49, 75, 77 odds



Scientific Notations

§7.3

Scientific Notation – a number written in the form $a \times 10^n$. $1 \leq a < 10$

Express each in scientific notation.

Example 1

4,062,000,000

Example 2

.0000813

Express each in standard form.

Example 3

1.8×10^{-4}

Example 4

6.49×10^7

Evaluate

Example 5

$(5 \times 10^{-6})(2.3 \times 10^{12})$

Example 6

$\frac{4.5 \times 10^8}{1.5 \times 10^{10}}$

Pg 419,20-39,80-82



Polynomials

§7.4

****terms are separated by + or – sign****

Monomial – one term

Binomial – two terms

Trinomial – three terms

Polynomial – monomial or sum of monomials.

Determine whether each expression is a polynomial and if so, identify.

Example 1

$$-8$$

Example 2

$$x^3 + 7x^{-2} + 5$$

Example 3

$$6x^5 - 3x^2 + 16x$$

Find the degree of each polynomial

Example 4

$$x^4 - 3x^3 + 12x^2$$

Example 5

$$6a^2b^3 + 15ab^4 - 4$$

Write each polynomial in standard form. Identify the leading coefficient.

Example 6

$$9x^2 + 3x^6 - 4x$$

Example 7

$$12 + 5y + 6xy + 8xy^2 + 8x$$

Example 8

From 2000 to 2006, the number N (in thousands) of patients seen by a medical facility can be modeled by the equation $N = t^2 + 2.1t + 0.8$, where t is the number of years since 2000. How many patients were seen in 2005?

Pg 427,20-40,48,70-72



Adding and Subtracting Polynomials
§7.5

Find each sum

Example 1

$$(7y^2 + 2y - 3) + (2 - 4y + 5y^2)$$

Example 2

$$(4x^2 - 2x + 7) + (3x - 7x^2 - 9)$$

Find each difference

Example 3

$$(6y^2 + 8y^4 - 5y) - (9y^4 - 7y + 2y^2)$$

Example 4

$$(6x^2 + 11x^3 + 2x) - (4x - 3 + 5x^2)$$

Example 5

The total amount of toy sales T (in billions of dollars) consist of two groups: sales of video games V and sales of traditional toys R . In Recent years, the sales of traditional toys and total sales represented by the following equations, where n is the number of years since 2000.

Think: $T(\text{total}) = V(\text{video}) + R(\text{toys})$ is this correct?

$$R = 0.46n^3 - 1.9n^2 + 3n + 19$$

$$T = 0.45n^3 - 1.85n^2 + 4.4n + 22.6$$

- Write an equation that represents the sales of video games.
- Use this equation to predict the video games sales in 2009.

Pg 436,10-21,23-27,46,52



Multiplying a Polynomial by a Monomial
§7.6

Find each product.

Example 1

$$2x^3(x^2 + 3x - 7)$$

Example 2

$$-3d^4(2d^3 - 4d^2 + 5d - 5)$$

Simplify.

Example 3

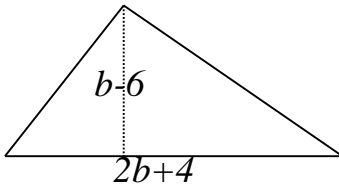
$$3g(4g^2 + 3g) - 6(-3g^2 - 3)$$

Example 4

$$3(2t^2 - 4t - 15) + 6t(t + 2)$$

Example 5

Find the area of the triangle below.



Pg 442,18-32 skip 30



Multiplying Polynomials

§7.7

FOIL – a method for multiplying two binomials.

F – first

O – outer

I – inner

L – last

Find each product.

Example 1

$$(y - 8)(y + 5)$$

Example 2

$$(2x + 3)(x - 4)$$

Example 3

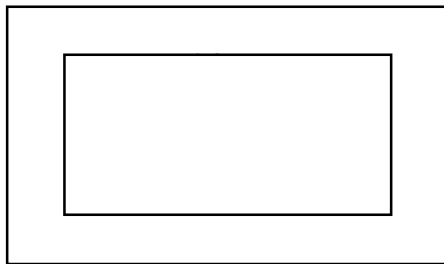
$$(5a + 2)(3a - 1)$$

Example 4

$$(3b + 4)(3b - 4)$$

Example 5

A contractor is building a deck around a rectangular swimming pool which measures 20' long and 15' wide. The deck is x feet from every side of the pool. Write an expression for the total area of the pool and deck.



Example 6

$$(3b + 4)(a^2 - 12a + 1)$$

Pg 450,1-31 odd



Special Products
§7.8

Sum of a Square - $(a + b)^2 = (a + b)(a + b)$

Example 1

$$(x + 5)^2$$

Example 2

$$(2y + 3)^2$$

Difference of a Square - $(a - b)^2 = (a - b)(a - b)$

Example 3

$$(x - 6)^2$$

Example 4

$$(3y - 5)^2$$

Product of Sum and Difference - $(a + b)(a - b) = a^2 - b^2$

Example 1

$$(x - 8)(x + 8)$$

Example 2

$$(2y + 7)(2y - 7)$$

Pg 456,12-20,22-32,45,66,72

