

Introduction to Monomials

Like any other subject, algebra has its own vocabulary— sets of words that are specific to the subject. To understand algebra, you must learn its vocabulary.

A **variable** is a letter or symbol used to represent a quantity that is unknown or can change. The letters x and y are the symbols most commonly used as variables but any letter can be used. Variables are also sometimes referred to as "unknowns." Common nouns can serve this purpose in the English language. For example, the word "cat" represents different cats; the variable x represents different numbers.

A **monomial** is a constant, a variable, or the product of constants and variables. A monomial never involves addition, subtraction, radicals of variables, or variables in a denominator.

For example, 2 , $9xy$, $-4u^7v^5w^{13}$, and $\frac{1}{2}a^2b$ are all monomials.

The following are not monomials:

$$9x + 2y$$

$$2\sqrt{x}$$

$$\frac{5}{x}$$

$$\frac{1}{3\sqrt{x}}$$

$$\frac{5}{3x^4}$$

4. Is $7b(2x)$ a monomial?

In this case, $7b$ and $2x$ are factors to be multiplied: $7b(2x) = 14bx$. (Remember, when you multiply, the variables "go along for the ride.") The result is the product of the constant 14 and the variables, b and x . So it is a monomial.

Notes:

- The monomial $14bx$ is written in standard form. This means that the constant comes first and the variables come second, in alphabetical order, when writing the product. In the question above, $7b(2x)$ is a monomial, but it is not written in standard form.
- When a monomial is written in standard form, the constant is called the **coefficient** of the monomial. In the monomial $14bx$, 14 is the coefficient.

Adding and Subtracting Monomials

Remember:

Monomials are referred to as "terms."

Only **like** terms may be added or subtracted.

What are "like terms"?

Like Terms are monomials with the same VARIABLE part.

Adding Monomials - Example 1

$$5x^3 + 3x^3$$

Adding Monomials - Example 2

$$2x^3y^2 + 7x^3y^2$$

Adding Monomials - Example 3

$$3xy^2 + 2xy^3$$

Subtracting Monomials - Example 1

$$3a^2 - 2a^2$$

Subtracting Monomials - Example 2

$$10a^3b^2c - 2a^3b^2c$$

Student Name: _____

Score: _____

Add the monomials

1. $2x^2, -8x^2$ _____

2. $12xy, xy$ _____

3. $10u, -2u$ _____

4. $5u^2v, 6u^2v$ _____

5. $-6pqr, 3pqr$ _____

6. $6a^6, -15a^6$ _____

7. $3p^3q, -2p^3q$ _____

8. $xyz, -6xyz$ _____

9. $5a^2bc^2, 8a^2bc^2$ _____

10. $8p^5, 12p^5$ _____

11. $5xy^2z, -7xy^2z$ _____

12. $8s^4t, -6s^4t$ _____

Student Name: _____

Score: _____

Subtract Monomials

$$4x - 2x = \underline{\hspace{2cm}}$$

$$11xy - 5xy = \underline{\hspace{2cm}}$$

$$7p^2 - 9p^2 = \underline{\hspace{2cm}}$$

$$12m^3n - 6m^3n = \underline{\hspace{2cm}}$$

$$z^5 - 5z^5 = \underline{\hspace{2cm}}$$

$$8pqr - 4pqr = \underline{\hspace{2cm}}$$

$$10a^2b^2 - a^2b^2 = \underline{\hspace{2cm}}$$

$$8l^7 - 3l^7 = \underline{\hspace{2cm}}$$

$$9c - 15c = \underline{\hspace{2cm}}$$

Student Name: _____

Score: _____

Subtract the second monomial from the first

1. $5a^2b$, $3a^2b$ _____

2. $3p^2qr$, $-7p^2qr$ _____

3. $8xyz$, $2xyz$ _____

4. $5r^3$, $8r^3$ _____

5. $12z$, $18z$ _____

6. $-15s^3t$, $11s^3t$ _____

7. $-x^3yz^2$, $12x^3yz^2$ _____

8. $18u^2v^2w$, $-2u^2v^2w$ _____

9. q^2rs , $-3q^2rs$ _____

10. $-2p^3q^3$, $4p^3q^3$ _____

11. $13y^2$, $2y^2$ _____

12. $3pqrst$, $-4pqrst$ _____

Name: _____

Questions 1 through 9 refer to the following:

Find the sum of the given terms:

1) $17z + (-19z)$

A) $2z$

B) $36z$

C) $-2z$

D) $-2z^2$

2) $-9x + (-3x)$

A) $12x$

B) $6x$

C) $-12x$

D) $-6x$

3) $-8z + (-7z)$

A) $-z$

B) $-15z$

C) $15z$

D) $-15z^2$

4) $-13x + 5x$

A) $-18x$

B) $18x$

C) $-8x$

D) $8x$

5) $13ab + (-21ab)$

A) $-34ab$

B) $8ab$

C) $34ab$

D) $-8ab$

6) $17rs + (-20rs)$

A) $-3rs$

B) $-3r^2s^2$

C) $37rs$

D) $3rs$

7) $-2xy + (-xy)$

A) $-3xy$

B) $-3x^2y^2$

C) $-2xy$

D) $-xy$

8) $\frac{5x^2}{6x^2}$

A) x

B) $11x^2$

C) $11x^4$

D) x^2

9) $\frac{-37y^3}{-14y^3}$

A) $23y^3$

B) $-23y^3$

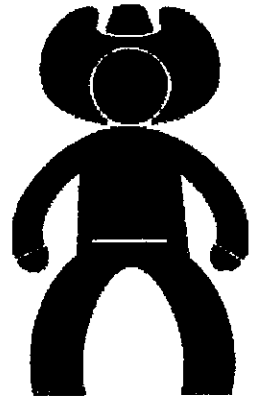
C) $51y^3$

D) $-51y^3$

Name _____

Adding & Subtracting Monomials Homework 1

10/9/18



Find each sum or difference.

1) $h^4 + h^4 =$ _____

2) $21f^6 - 64f^6 =$ _____

3) $70d^3 + d^3 =$ _____

4) $95s^7 - (-5s^7) =$ _____

5) $26x^5 - 20x^5 =$ _____

6) $-27m - m =$ _____

7) $2n^3 + 3n^2 =$ _____

8) $47p^3 + 3p^3 =$ _____

9) $g^7 + 7g^7 =$ _____

10) $53v^2 - (-v^2) =$ _____

11) $84w^5 - 4w =$ _____

12) $-100b^3 - 17b^3 =$ _____



Name: Quiz Review

Questions 1 through 4 refer to the following:

Find the sum of the given terms:

1)
$$\frac{9rs}{rs}$$

2)
$$\frac{5x^2}{6x^2}$$

A) $11x^2$

B) x

C) x^2

D) $11x^4$


3)
$$\frac{7x}{8x}$$

A) x

B) $15x$

C) $15x^2$

D) $-x$



$$\frac{-14x^2y^2}{23x^2y^2}$$

Questions 5 through 8 refer to the following:

Find the difference of the given terms:

5)
$$\frac{3a^2b^2}{7a^2b^2}$$

A) $4a^2b^2$


B) $-10a^2b^2$

C) $-4a^2b^2$

D) $10a^2b^2$

6)
$$\frac{-8z}{3z}$$

7) $-4abc - (-9abc)$


8) $12x^2y^2 - x^2y^2$