Writing Algebraic Expressions, Translating from Key Words—Explanation & Practice

Instruction Addition, subtraction, multiplication, and division may be used to combine letters and numbers in an algebraic expression. The symbols for addition and subtraction in algebra are the same as those used in arithmetic.

$a + b$ may be read
"a plus b."
"b added to a."
"a increased by b."
"b more than a."
"the sum of a and b."

$a - b$ may be read
"a minus b."
"a diminished by b."
"a decreased by b."
"the difference of a and b."
"b subtracted from a."
"b less than a."

Example

6 increased by x ⟶ $6 + x$
8 more than a ⟶ $a + 8$
y decreased by 3 ⟶ $y - 3$
2 less than b ⟶ $b - 2$

In algebra, the multiplication symbol x is usually omitted. $5 \times a$ is written as $5 \cdot a$, $5(a)$, or $5a$. $5 \times a^2$ is written as $5 \cdot a^2$, $5(a^2)$, or $5a^2$.

The term ab may be read
"a times b."
"b multiplied by a."
"the product of a and b"

Example

6 times y ⟶ $6y$
x multiplied by 3 ⟶ $3x$
the product of x^2 and y ⟶ x^2y

In algebra, the division symbol ÷ is usually omitted. $5 \div a$ is written $\frac{5}{a}$. $5 \div a^2$ is written $\frac{5}{a^2}$.

The term $\frac{a}{b}$ may be read
"a divided by b."
"the quotient of a and b."

Example

$x \div 6$ ⟶ $\frac{x}{6}$

3 divided by a ⟶ $\frac{3}{a}$

the quotient of 12 and b ⟶ $\frac{12}{b}$

Key Words

Symbol	**+**	**–**	**2 · 3 2(3) 2 x**	**) ÷ a/b**	**=**
Operation	**Addition**	**Subtraction**	**Multiplication**	**Division**	**Equals**
Answer	**SUM**	**DIFFERENCE**	**PRODUCT**	**QUOTIENT**	
Key Words	**More than** **Rises** **Together** **Perimeter** **Total** **Plus** **Increased by** **Altogether** **Both** **Combined** **In all**	**Less** **Decreased by** **Falls** **Minus** **Less than** **Farther** **Change (Money)** **Left** **Lose (or Lost)** **Reduce (Reduction)** **Remain (Remaining)** **Nearer**	**Times** **Of** **Twice** **Double** **Triple** **Squared** **Cubed**	**Shared** **Equally** **Into** **Per** **Ratio** **Average** **Cut** **Each** **Every** **Split**	**Is** **Was** **Gives** **Should be** **Yields** **Amounts to** **Represents** **Is the same as**
Special Notes	**AND does <u>not</u> mean to add**	*** The terms LESS THAN and SUBTRACTED FROM reverse the order of the numbers EX: "seven less than ten" is 10 - 7**	*** Twice and Double mean 2 times, <u>not</u> squared Example: 2 · x <u>not</u> x · x (same for triple and cubed)**		

Practice A Write an algebraic expression indicating the following operations. The first one has been done.

1. x plus y $x + y$

2. x times y

3. x minus y

4. x divided by y

5. the product of a and b

6. the quotient of a and b

7. c diminished by d

8. c decreased by d

9. y multiplied by x

10. y added to x

11. m less than n

12. the product of m and n^2

13. c increased by d

14. c divided by a

15. x more than y

16. the difference of x and y

17. x increased by 5

18. the sum of a and b

Practice B Write an algebraic expression indicating the following operations. The first one has been done.

1. x less than z $z - x$

2. b times x

3. c more than d

4. y divided by a

5. the product of a and c

6. y subtracted from x

7. m added to a

8. c diminished by d

9. the sum of a and p

10. a^2 multiplied by 2

11. x^2 divided by y^2

12. c^2 plus d^2

13. the product of a^2 and b^2

14. x increased by y

15. m minus n

16. a^2 divided by c

17. y^2 more than a

18. x decreased by y

Practice C Translate the following into mathematical expressions:

1. Four less than some number.

2. Five less than 3 times some number.

3. The quotient of some number and -2.

4. The sum of some number and 4, divided by 16.

5. -2 subtracted from the product of 6 and some number.

6. 3 added to the quotient of 1 and some number.

7. 14 more than the difference of 16 and some number.

8. One-third of the difference of some number and -1.

9. One-fifth the sum of some number and 8.

10. Four less than the product of three and some number.

Answer Key
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A.

1. $x + y$
2. $x \cdot y$ or xy
3. $x - y$
4. $x \div y$ or $\frac{x}{y}$
5. $a \cdot b$ or ab
6. $a \div b$ or $\frac{a}{b}$
7. $c - d$
8. $c - d$
9. $y \cdot x$ or yx
10. $x + y$
11. $n - m$
12. $m \cdot n^2$ or mn^2
13. $c + d$
14. $c \div a$ or $\frac{c}{a}$
15. $y + x$
16. $x - y$
17. $x + 5$
18. $a + b$

B.

1. $z - x$
2. $b \cdot x$ or bx
3. $d + c$
4. $y \div a$ or $\frac{y}{a}$
5. $a \cdot c$ or ac
6. $x - y$
7. $a + m$
8. $c - d$
9. $a + p$
10. $a^2 \cdot 2$ or $2a^2$
11. $x^2 \div y^2$ or $\frac{x^2}{y^2}$
12. $c^2 + d^2$
13. $a^2 \cdot b^2$ or a^2b^2
14. $x + y$
15. $m - n$
16. $a^2 \div c$ or $\frac{a^2}{c}$
17. $a + y^2$
18. $x - y$

C.

1. $n - 4$

2. $3n - 5$

3. $n \div (-2)$ or $\frac{n}{-2}$

4. $\frac{n+4}{16}$

5. $6n - (-2)$

or $(6 \cdot n) + 2$ or $6n + 2$

6. $(1 \div n) + 3$ or $\frac{1}{n} + 3$

7. $(16 - n) + 14$

8. $\frac{1}{3}(n - (-1))$ or $\frac{1}{3}(n + 1)$

9. $\frac{1}{5}(n + 8)$

10. $3n - 4$