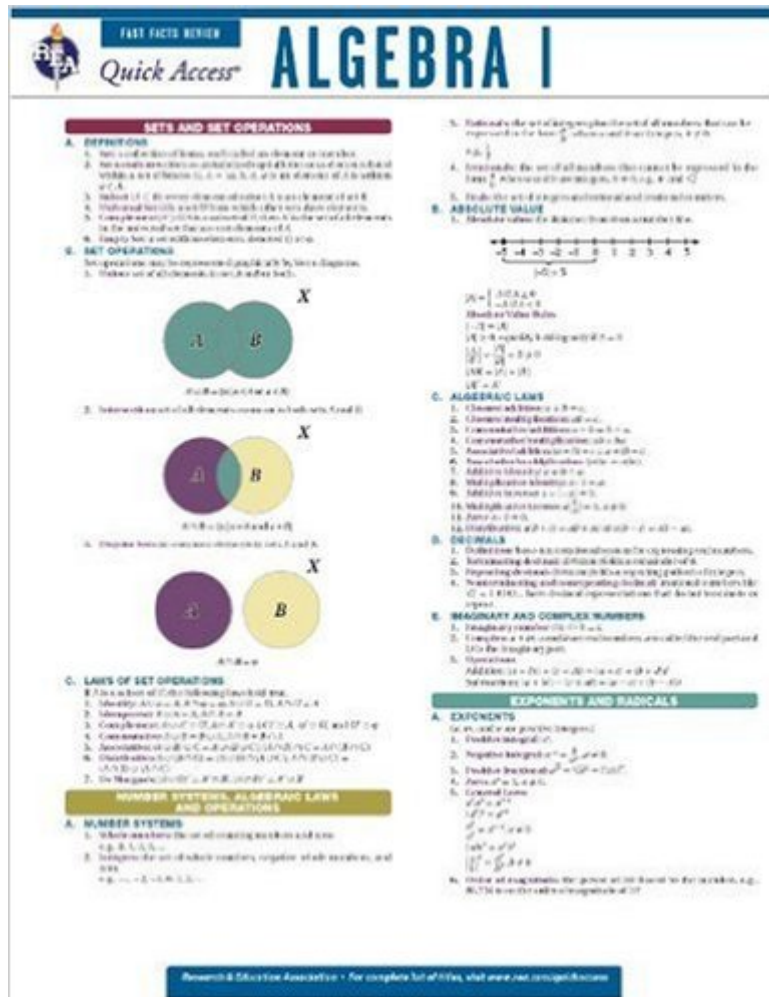


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Algebra 1 - REA's Quick Access Reference Chart (Quick Access Reference Charts)



FAST FACTS REVIEW
Quick Access **ALGEBRA I**

SETS AND SET OPERATIONS

A. DEFINITIONS

- Set: a collection of items, each called an element or member.
- Finite set: a set with a finite number of elements. Example: the set of integers $\{1, 2, 3, 4, 5\}$ or the set of letters $\{A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z\}$.
- Subset (\subset): An element or set of elements A is a subset of set B .
- Equivalent sets: A and B are equivalent if they have the same number of elements.
- Complementary set: The complement of set A is the set of all elements in B that are not in A .
- Disjoint sets: Two sets with no elements in common.

B. SET OPERATIONS

Set operations can be represented graphically with Venn diagrams.

- Union: set of all elements from A and B together.

C. LAWS OF SET OPERATIONS

If A is a set of elements and B is a set of elements:

- Identity: $A \cup \emptyset = A$ and $A \cap \emptyset = \emptyset$.
- Subgrouping: $A \cup (A \cap B) = A$ and $A \cap (A \cup B) = A$.
- Grouping: $(A \cup B) \cup C = A \cup (B \cup C)$ and $(A \cap B) \cap C = A \cap (B \cap C)$.
- Commutative: $A \cup B = B \cup A$ and $A \cap B = B \cap A$.
- Distributive: $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ and $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.
- De Morgan's: $(A \cup B)^c = A^c \cap B^c$ and $(A \cap B)^c = A^c \cup B^c$.

NUMBER SYSTEMS, ALGEBRAIC LAWS AND OPERATIONS

A. NUMBER SYSTEMS

- Whole numbers: the set of counting numbers and zero.
e.g. $0, 1, 2, 3, \dots$
- Integers: the set of whole numbers, negative whole numbers, and zero.
e.g. $\dots, -3, -2, -1, 0, 1, 2, 3, \dots$

B. OPERATIONS

- Addition: $a + b = c$
- Subtraction: $a - b = c$
- Multiplication: $a \times b = c$
- Division: $a \div b = c$

C. ALGEBRAIC LAWS

- Commutative: $a + b = b + a$ and $ab = ba$
- Associative: $(a + b) + c = a + (b + c)$ and $(ab)c = a(bc)$
- Distributive: $a(b + c) = ab + ac$
- Identity: $a + 0 = a$ and $a \times 1 = a$
- Inverse: $a + (-a) = 0$ and $a \times \frac{1}{a} = 1$ (for $a \neq 0$)

D. ORDER OF OPERATIONS

- Grouping symbols: parentheses, brackets, braces, absolute value, and power.
- Exponents.
- Multiplication and division.
- Addition and subtraction.

E. OTHERS

- Order of operations: PEMDAS (Parentheses, Exponents, Multiplication, Division, Addition, Subtraction).
- Order of operations: PEMDAS (Parentheses, Exponents, Multiplication, Division, Addition, Subtraction).

EXONENTS AND RADICALS

A. EXPONENTS

- Exponent: a number that tells how many times to multiply a number by itself.
- Power: a number raised to a power.
- Root: a number that, when multiplied by itself a certain number of times, gives the original number.
- Radical: a number that is the root of another number.
- Exponent Laws:
 $a^m \times a^n = a^{m+n}$
 $\frac{a^m}{a^n} = a^{m-n}$
 $(a^m)^n = a^{m \times n}$
 $a^{-n} = \frac{1}{a^n}$
 $a^0 = 1$ (for $a \neq 0$)

B. RADICALS

- Radical: a number that is the root of another number.
- Order of operations: PEMDAS (Parentheses, Exponents, Multiplication, Division, Addition, Subtraction).

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Synopsis

Fast Facts at Your Fingertips! REA's Quick Access Study Charts contain all the information students, teachers, and professionals need in one handy reference. They provide quick, easy access to important facts. The charts contain commonly used mathematical formulas, historical facts, language conjugations, vocabulary and more! Great for exams, classroom reference, or a quick refresher on the subject. Most laminated charts consist of 2 fold-out panels (4 pages) that fit into any briefcase or backpack. Each chart has a 3-hole punch for easy placement in a binder. Each chart measures 8 1/2" x 11"

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