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2026

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Reza Nazari

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The Most Comprehensive Review of Algebra I

By

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A1. A. REI. D. 7 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
A1. A. REI. C. 4 Write and solve a system of linear equations in context.
A1. F. IF. B. 4 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
8. EE. A. 1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.
8. WCE. 6 Apply properties of exponents to include variable expressions.
A1. A. SSE. B. 3c Use the properties of exponents to rewrite exponential expressions.
A1. A. APR. A. 1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials
A1. A. SSE. A. 2 Use the structure of an expression to identify ways to rewrite it.
A1. A. APR. B. 2 Identify zeros of polynomials when suitable factorizations are available and use the zeros to construct a rough graph of the function defined by the polynomial.
A1. A. REI. B. 3 Solve quadratic equations and inequalities in one variable. a. Use the method of completing the square to rewrite any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions.
A1. A. SSE. B. 3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression in the form $AX^2 + Bx + C$ where $A = 1$ to reveal the maximum or minimum value of the function it defines.

Standards
Functions
A1. F. IF. B. 3 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

A1. F. IF. A. 1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.
A1. F. IF. A. 2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
A1. F. IF. B. 4 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
A1. F. IF. C. 6 Graph functions express symbolically and show key features of the graph, by hand and using technology. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
A1. F. BF. B. 2 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k, k\,f(x), f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Clarification: i) Identifying the effect on the graph of replacing $f(x)$ by $f(x) + k, k\,f(x)$, and $f(x + k)$ for specific values of k (both positive and negative) is limited to linear, quadratic, and absolute value functions. ii) $f(kx)$ will not be included in Algebra 1. It is addressed in Algebra 2. iii) Experimenting with cases and illustrating an explanation of the effects on the graph using technology is limited to linear functions, quadratic functions, absolute value, and exponential functions with domains in the integers. iv) Tasks do not involve recognizing even and odd functions.
A1. F. BF. A. 1 Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
A1. F. LE. A. 1 Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Recognize that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.
A1. F. LE. A. 2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table.)
A1. F. LE. B. 4 Interpret the parameters in a linear or exponential function in terms of a context. Clarification

A1.F.IF.B.5 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
A1.F.LE.A.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
A1.F.IF.C.7 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
A1.F.IF.C.8 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

Standards
Statistics and Probability
A1.S.ID.C.5 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
A1.S.ID.A.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).
A1.S.ID.A.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
A1.S.ID.A.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
A1.S.ID.B.4 Represent data on two quantitative variables on a scatter plot and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. b. Fit a linear function for a scatter plot that suggests a linear association.
A1.S.ID.C.6 Use technology to compute and interpret the correlation coefficient of a linear fit.
A1.S.ID.C.7 Distinguish between correlation and causation.

Multiplying and Dividing Integers

Solve.

1) $(-6) \times (-7) =$ _____

2) $8 \times (-5) =$ _____

3) $48 \div (-8) =$ _____

4) $(-72) \div 9 =$ _____

5) $(4) \times (-6) =$ _____

6) $(-9) \times (-11) =$ _____

7) $(10) \div (-5) =$ _____

8) $144 \div (-12) =$ _____

9) $(10) \times (-2) =$ _____

10) $(-8) \times (-2) \times 5 =$ _____

11) $(8) \div (-2) =$ _____

12) $45 \div (-15) =$ _____

13) $(5) \times (-7) =$ _____

14) $(-6) \times (-5) \times 4 =$ _____

15) $(12) \div (-6) =$ _____

16) $(14) \div (-7) =$ _____

17) $196 \div (-14) =$ _____

18) $(27 - 13) \times (-2) =$ _____

19) $125 \div (-5) =$ _____

20) $66 \div (-6) =$ _____

21) $(-6) \times (-5) \times 3 =$ _____

22) $(15 - 6) \times (-3) =$ _____

23) $(32 - 24) \div (-4) =$ _____

24) $72 \div (-6) =$ _____

25) $(-14 + 8) \times (-7) =$ _____

26) $(-3) \times (-9) \times 3 =$ _____

27) $84 \div (-12) =$ _____

28) $(-12) \times (-10) =$ _____

29) $22 \times (-3) =$ _____

30) $(-2) \times (-6) \times 5 =$ _____

31) $(24) \div (-3) =$ _____

32) $(-15) \div (3) =$ _____



Translate Phrases into an Algebraic Statement

Translate each phrase into an algebraic statement.

1) Seven more than a number is 18. _____

2) 12 times the sum of 5 and x. _____

3) The square of 12. _____

4) Nine less than a number is 11. _____

5) Six more than a number is 14. _____

6) 10 times the sum of 7 and x. _____

7) 25 multiplied by x. _____

8) Two less than a number is 12. _____

9) 8 times the sum of 8 and x. _____

10) Three more than a number is 10. _____

11) The difference between forty–eight and y. _____

12) 27 divided by x. _____

13) 17 multiplied by x. _____

14) The difference between x and 29 is 14. _____

15) 56 divided by x. _____



Order of Operations

Calculate.

1) $16 + (30 \div 5) =$ _____

2) $(3 \times 9) \div (-3) =$ _____

3) $57 - (3 \times 8) =$ _____

4) $(-12) \times (7 - 3) =$ _____

5) $(18 - 7) \times (6) =$ _____

6) $(6 \times 10) \div (12 + 3) =$ _____

7) $(13 \times 2) - (24 \div 6) =$ _____

8) $(-5) + (4 \times 3) + 8 =$ _____

9) $(4 \times 2^3) + (16 - 9) =$ _____

10) $(3^2 \times 7) \div (-2 + 1) =$ _____

11) $[-2(48 \div 2^3)] - 6 =$ _____

12) $(-4) + (7 \times 8) + 18 =$ _____

13) $(3 \times 7) + (16 - 7) =$ _____

14) $[3^3 \times (48 \div 2^3)] \div (-2) =$ _

15) $(14 \times 3) - (3^4 \div 9) =$ _____

16) $(96 \div 12) \times (-3) =$ _____

17) $(48 \div 2^2) \times (-2) =$ _____

18) $(56 \div 7) \times (-5) =$ _____

19) $(-2^2) + (7 \times 9) - 21 =$ ___

20) $(2^4 - 9) \times (-6) =$ _____

21) $[4^3 \times (50 \div 5^2)] \div (-16) =$

22) $(3^2 \times 4^2) \div (-4 + 2) =$ ____

23) $6^2 - (-6 \times 4) + 3 =$ _____

24) $4^2 - (5^2 \times 3) =$ _____

25) $(-4) + (12^2 \div 3^2) - 7^2 =$ __

26) $(3^2 \times 5) + (-5^2 - 9) =$ ____

27) $2[(3^2 \times 5) \times (-6)] =$ _____

28) $(11^2 - 2^2) - (-7^2) =$ _____

29) $(2^2 \times 5) - (64 \div 8) =$ _____

30) $2[(3^2 \times 4) + (35 \div 5)] =$ ___

31) $(4^2 \times 3) \div (-6) =$ _____

32) $3^2[(4^3 \div 16) - (3^3 \div 27)] =$