Algebra 1 Math Journal Topics

Each unit has a set number of required topics that must be answered, following the requirements on the Math Journal Rubric. The rubric has a 4 point system, 0, 1, 2, and 3. You must maintain an 80% average, or 2.4 points. If this requirement is not met, you will need to revise a response and resubmit your journal. Questions must meet rubric requirements as well.

Unit 1: Real Numbers and Operations
(Up to 2 can be questions)

- Chapter A: Expressions, Equations and Functions (Choose 2)
    o Describe the steps you would take to evaluate the expression n^5 when n=3. Then evaluate the expression.
    o Describe the steps you would use to evaluate the expression $2(3x+1)^2$ when x=3.
    o Explain how to write $\frac{20\ miles}{4\ hours}$ as a unit rate.
    o Describe the difference between an expression and an equation.
    o In the equation b=a-2, which variable is the independent variable and which is the dependent variable?
    o Given the graph of a function, describe how to write a rule for the function.

- Chapter B: Properties of Real Numbers (Choose 2)
    o Describe the difference between whole numbers and positive integers.
    o Without actually adding, how can you tell if the sum of two numbers will be zero?
    o Without actually subtracting, how can you tell whether a chance in quantity will be negative?
    o Describe the difference between the identity property of multiplication and the multiplicative property of -1.
    o Are the expressions 2(x + 1) and 2x + 1 equivalent?
    o How can you tell whether the mean of n numbers is negative without actually dividing the sum of the numbers by n?
    o Without calculating, how can you tell whether the square root of a whole number is rational or irrational?

Unit 2: Solving Linear Equations and Inequalities
(Two can be questions)
- Chapter 1: Solving Linear Equations (Choose 2)
  - Which property of equality would you use to solve the equation $14x = 56$?
  - Are the equations $-2x = 10$ and $-5x = 25$ equivalent?
  - Describe two ways to solve the equation $2(4x – 11) = 10$.
  - Describe the steps in solving the linear equation $3(3x – 8) = 4x + 6$.
  - Without calculating, how do you know that the equation $|4x – 7| = -1$ has no solution?
  - What is an extraneous solution?

- Chapter 2: Solving Linear Inequalities (Choose 1)
  - Describe how to graph an inequality.
  - Compare solving equations using addition with solving inequalities with addition.
  - Write an inequality that is solving using the Division Property of Inequality where the inequality symbol needs to be reversed. Solve the inequality, identifying all of the steps.
  - Compare solving multi-step inequalities and solving multi-step equations.

- Chapter 3A: Linear Functions (choose 1)
  - How are independent variables and dependent variables different?
  - Compare linear functions and nonlinear functions.
  - Compare discrete domains and continuous domains.

Unit 3: Graphing and Writing Linear Functions
(Up to 3 can be questions)
- Chapter 3B: Graphing Linear Functions (Choose 2)
  - How are x-intercepts and y-intercepts alike? How are they different?
  - What is a constant function? What is the slope of a constant function?
  - What is the slope-intercept form of a linear function? Explain why this form is called the slope-intercept form.
  - How does the value of a in the equation $y=f(ax)$ affect the graph of $y=f(x)$? How does the value of a in the equation $y=af(x)$ affect the graph of $y=f(x)$?
  - Describe three different types of transformations of the graph of an absolute value function.

- Chapter 4: Writing Linear Functions (Choose 1)
  - Explain how you can use slope-intercept form to write an equation of a line given its slope and y-intercept.
  - Two lines are perpendicular. The slope of one line is -5/7. What is the slope of the other line?
  - Compare piecewise functions and step functions.

Unit 4: Solving Systems of Linear Equations and Inequalities
(One can be from questions)
- Chapter 5: Solving Systems of Linear Equations (Choose 2)
  - Do the equations $5y - 2x = 18$ and $6x = -4y - 10$ form a system of linear equations?
  - Describe how to solve a system of linear equations by substitution.
  - Explain how to solve a system of linear equations by elimination.
  - Compare the graph of a system of linear equations that has infinitely many solutions and the graph of a system of linear equations that has no solutions.
  - Is it possible for a system of linear equations to have exactly two solutions?
  - Compare the graph of a linear inequality in two variables with the graph of a linear equation in two variables.
  - How can you verify that an ordered pair is a solution of a system of linear inequalities?

Unit 5: Radical, Rational, and Polynomial Functions
(Two can be from questions)
- Chapter 6: Exponential Functions and Sequences (Choose 2)
  - Explain how and when to use the Power of a Product Property.
  - Explain when and how to use the Quotient of Powers Property.
  - Explain how to evaluate $81^{1/4}$.
  - Why is a the y-intercept of the graph of the function $y=ab^x$.
  - Compare the graph of $y=2(5)^x$ with the graph of $y = 5^x$.
  - Describe how to solve an exponential equation with unlike bases.

- Chapter 7: Polynomial Equations and Factoring (Choose 2)
  - When is a polynomial in one variable in standard form?
  - Explain how the letters of the word FOIL help you to remember how to multiply two binomials.
  - Explain how to use the square of a binomial pattern.
  - Explain how to use the Zero Product Property to find the solutions of the equation $3x(x - 6) = 0$.
  - You are factoring $x^2 + 11x - 26$. What do the signs of the terms tell you about the factors?
  - Compare factoring $6x^2 - x - 2$ with factoring $x^2 - x - 2$.
  - What does it mean for a polynomial to factored completely?