Math Worksheet for 9th Grade

Overview and history of algebra

Name: Due Date: Teacher: Parent Sign:

Questions

1. Who was Al-Khwarizmi and why is he important to algebra?
2. What does the Arabic word ”al-jabr” (from which ”algebra” comes) mean?
3. Which ancient civilization recorded solutions to quadratic-like problems on clay tablets?
4. Who wrote the book ”Arithmetica,” an important early work in algebra?
5. Name one contribution of ancient Chinese mathematicians to early algebra.
6. Why do we use letters (like x and y) in algebra instead of always writing things in words?
7. Define, in one sentence each: (a) variable, (b) constant.
8. Translate into an algebraic equation: ”Seven more than a number is 15.”
9. Solve for x: $3x + 7 = 22$.
10. The sum of two consecutive integers is 25. Find the integers.
11. Find a general formula for the nth term of the sequence 2, 5, 8, 11, ...
12. In your own words: why do some mathematicians call algebra ”beautiful”?
13. Name the two axes on the coordinate plane and the origin.
14. What quadrant is the point (3, -2) in?
15. Find the distance between the points (0,0) and (3,4).
16. Find the slope of the line through (1,2) and (3,8).
17. Write the equation of the line with slope 2 and y-intercept -1.
18. What is the x-intercept of the line $y = 2x - 6$?
19. A point is at (-4, 0). On which axis does it lie?
20. When might you prefer letters a, b, c instead of x, y in an algebraic expression?
21. Evaluate $2x^2 - 3x + 5$ when $x = 2$.
22. Simplify: $4a - 2a + 7$.
23. Solve the system: $2x + y = 7$ and $x - y = 1$.
24. Which came first historically: writing algebra problems entirely in words (rhetorical algebra) or using symbolic notation? Name one mathematician who helped introduce symbolic notation.
25. Which mathematician is often credited with introducing letters to represent unknowns and parameters (early use of symbols)?
26. A merchant had some apples. He sold half of them plus 2 more and then had 10 left. How many apples did he start with?
27. Use letters to give a general formula for the area of a rectangle and explain the roles of the letters.
28. Translate into an equation: ”Three times a number decreased by 4 equals 11.”
29. Solve: $x^2 - 5x + 6 = 0$.

30. If y varies directly as x and y = 12 when x = 3, find the constant of variation and y when x = 5.

31. For the line y = -($\frac{1}{2}$)x + 3, what is y when x = 4?

32. Find the midpoint between (2, -1) and (6, 3).

33. Explain briefly why using letters in algebra makes formulas more useful than just numerical examples.

34. Where does the word ”algorithm” come from (which mathematician/name)?

35. Verify the identity $(a + b)^2 = a^2 + 2ab + b^2$ for a = 2 and b = 3.

36. What is the difference between a variable and an unknown?

37. The product of a number and its successor is 72. Find the number(s).

38. Solve for x: x/3 + 5 = 9.

39. Give a real-world situation that can be modeled with a simple linear equation, write the equation, and identify the variables.

40. Which quadrant contains points with negative x and negative y?

41. If a = 4 and b = -1, evaluate $3a^2 + b^2$.

42. A line passes through (1,1) and has slope 0. What is its equation?

43. In the general quadratic ax^2 + bx + c = 0, what are a, b and c called, and what condition must a satisfy?

44. A number decreased by one-fourth of itself equals 45. Find the number.

45. Expand and simplify (x + 2)(x + 3).

46. On a coordinate plane a point moves from (2,3) to (-2,3). How far did it move?

47. True or False: Ancient mathematicians used the same symbolic letters and equals sign that we use today. Explain briefly.

48. Solve: 5(2x - 3) = 4x + 7.

49. Give two uses of the coordinate plane in algebra.

50. Given A(0,2) and B(4,0), find the slope of AB and write the equation of the line through A and B.