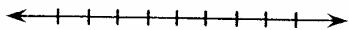


Level 1 Algebra 2 Final Exam - 2003

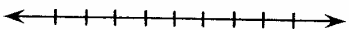
Name \_\_\_\_\_

Directions: Please show all work! If no work is shown, then partial credit will not be given. Please use extra paper for showing your work, number each problem and remember to put your name on the each paper. Final answers should be placed on the answer sheet provided. Neatness is expected. If an answer can not be read, it will be marked incorrect. If you do not understand the phrasing of a question, please ask. Good Luck!

1. Evaluate  $2a^3 + (2a)^2$  when  $a = -2$ .
2. Solve for  $u$  in terms of  $w$ :  $3u - w = u - 5w$
3. Solve the inequality. Then graph your solution.  $2x + 5 \geq 2 - (x - 9)$



4. Solve the inequality. Then graph your solution.  $|3x - 2| \leq 5$



5. Find the domain of the relation  $\{(-4, -1), (1, 3), (-3, 4)\}$ .
6. Determine whether the relation is a function.  
 $(4, 0), (4, 1), (5, 2), (6, 3), (6, 4)$
7. Line 1 contains  $(2, -4)$  and  $(0, 2)$ . Line 2 contains  $(-4, 5)$  and  $(-1, 6)$ . Are the lines parallel, perpendicular, or neither?
8. Find the slope and  $y$ -intercepts of the line.  $3x - 7y = 42$
9. Write the equation of the line, in slope-intercept form, that passes through the point  $(5, -2)$  and has slope  $-2$ .
10. For the following data:
  - A. Make a scatter plot of the data.
  - B. Approximate the best fitting line for the data.
  - C. Find an equation of your line of best fit.

$x$	1	2	3	4	5	6	7	8
$y$	1.75	3.1	2.95	4	4.15	6.1	5.95	7

11. Evaluate  $f(-3)$ .  $f(x) = \begin{cases} -x^2 + 2x, & x \leq 1 \\ -2x + 3, & x > 1 \end{cases}$

12. Find the solution to the system by graphing.

$$x + y = -1$$

$$2x - y = 4$$

13. Tell how many solutions the linear system has: infinitely many solutions, one solution, or no solution.

$$x - 4y = 2$$

$$x + 4y = 2$$

14. The drama club sold 1500 tickets for the end-of-year performance. Admission prices were \$12 for adults and \$6 for students. The total amount collected at the box office was \$16,200. How many students attended the play?

15. Solve the system.

$$7x - 4y = -3$$

$$2x + 5y = -7$$

16. Find the maximum and minimum values of

$$C = 4x + 6y$$

Subject to the following constraints.

$$x + y \geq 1$$

$$6x - 3y \leq 6$$

$$4y \leq 5x + 4$$

17. Subtract:  $\begin{bmatrix} 23 & -13 \\ 35 & -31 \end{bmatrix} - \begin{bmatrix} -18 & -20 \\ 9 & 19 \end{bmatrix}$

18. Perform the matrix operations, if possible.  $5 \begin{bmatrix} 2 & 1 & -5 \\ 6 & -3 & 4 \end{bmatrix}$

19. Given  $A = \begin{bmatrix} 0 & -2 & 1 \\ 2 & -1 & 0 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 & 4 \\ 0 & 1 \\ 3 & -1 \end{bmatrix}$ , find  $AB$ .

20. Evaluate the determinant of the matrix.  $\begin{vmatrix} 1 & 6 \\ 4 & 4 \end{vmatrix}$

21. Write in standard form and graph:  $y = (x+1)^2 + 2$

22. Graph the function. Label the vertex, axis of symmetry, and  $x$ -intercepts.

$$y = -2(x-3)(x-5)$$

23. Graph the function. Label the vertex, axis of symmetry, and x-intercepts.  
 $y = x^2 + 2x + 3$
24. Solve the equation.  $x^2 + 2x - 35 = 0$
25. State the discriminant of the quadratic.  $5x^2 - 3x - 12 = 0$
26.  $(-3d^2ef^4)^2$
27.  $\frac{6x^2}{y^3} \cdot \frac{y^{-2}x^3}{9x^2}$
28. Decide whether the function is a polynomial function. If it is, state its degree, type, and leading coefficients.  
 $f(x) = 2x^3 - 2x^2 + 3.$
29. Add:  $(4z^4 - 7z^2 + 8) + (3z^4 + 3z + 5)$
30. Subtract:  $(2x^4 - 5x) - (3x - 2 - 7x^4)$
31. Multiply:  $(x + 4)(x^2 + 4x + 3)$
32. Divide:  $(2x^3 + 9x^2 + 3x - 6) \div (x + 4)$
33. One zero of the function  $f(x) = 2x^3 + 11x^2 + 18x + 9$  is  $x = -3$  find the other zeros of the function.
34. Evaluate: Evaluate without a calculator:  $81^{3/4}$
35. Evaluate without a calculator.  $16^{-5/4}$
36. Use a calculator to evaluate  $(16)^{-1/3}$ . Round the result to three decimal places.

Simplify:

37.  $x^{1/3} \cdot x^{1/4}$

Simplify:

38.  $\left(\frac{b^{25}}{c^{15}}\right)^{3/5}$

39. Find the inverse of the relation  $f = \{(-4, 2), (2, -4), (-5, -8)\}$ .

40. Find an equation for the inverse of the relation  $y = 6x - 3$ .

41. Refer to the function  $g(x) = 2 + \sqrt{x+1}$ . What is the domain of  $g(x)$ ?

Solve the equation. Check for extraneous solutions.

42.  $\sqrt{x+42} = x$

43.  $3x^{3/4} = 192$

44. Graph:  $f(x) = 2^x$

45. Write the equation  $\log_{64} 16 = \frac{2}{3}$  in exponential form.

46. Find the inverse of the function.  $y = \log_{1/5} x$

47. Evaluate without using a calculator.  $\log_2 16$

48. Evaluate the expression.  $\log_{1/5} 125$

49. Condense the expression.  $\frac{1}{2}\log_5 16 - 3\log_5 x + 4\log_5 y$

50. Solve:  $\frac{1}{125} = 25^{9x+3}$