Algebra I Challenge Exam **REVIEW**

Note: Graph paper is needed.

1. Solve the inequality and graph. $x-3\le -5$

2. Solve and graph. $-6k>-18$

3. Solve. $\frac{x}{2}\le -2$

4. Solve. $5(x-2)\le 10$

5. Solve. $-1\le x-2<3$

6. Solve and graph. $2x<-4$ or $x+3>1$

7. Solve. $|x-1|=6$

8. Solve and graph. $|x-4|<1$

9. Graph. $y\ge 2x+1$

10. Graph the system and state the solution. $-x+y=3$

$y=-\frac{1}{2}x+6$

11. Using linear combination, solve the system. $-4x+5y=-30$

$2x-15y=-10$

12. You spent \$16.50 to rent 6 movies for the week. New releases rent for \$3.00 and regular movies rent for \$2.50. How many regular movies did you rent?

13. State whether the system has infinite, none, or one solution. $2x+2y=-4$

$y=-x+2$

14. Graph the linear inequality system. $y \le -2x+2$

$y \ge x-2$

15. Simplify. $x^3 \bullet x^4$

16. Simplify. $(n^4)^3$

17. Simplify. $(3m)^2(2a^2)^2$

18. Evaluate the expression. 3^0

19. Re-write the expression with positive exponents. $\dfrac{5}{m^{-3}}$

20. Re-write the expression with positive exponents. x^3y^{-2}

21. Simplify the expression with only positive exponents. $\dfrac{10x^4}{6x}$

22. Simplify the expression with only positive exponents. $\dfrac{7x^6}{y} \bullet \dfrac{y^2}{x^3}$

23. Write the number in decimal form. $2.5 \ x \ 10^{-3}$

24. Write the number in scientific notation. $1{,}275{,}000$

25. Perform the indicated operation.
Write the answer in scientific notation. $(4 \ x \ 10^{-1}) \ (6 \ x \ 10^{5})$

26. Evaluate the expression. $-\sqrt{36}$

27. Solve the equation. $5y^2 - 80 = 0$

28. Simplify the expression. $\sqrt{45}$

29. Simplify the expression. Leave no radical in the denominator. $\sqrt{\dfrac{16}{3}}$

30. Graph and label the vertex. $y = x^2 - 4x - 3$

31. Use the quadratic formula to solve the equation. $x^2 - 3x - 5 = 0$

32. Write the equation in the standard form of $ax^2 + bx + c = 0$. $-2x^2 + x = 3$

33. State the discriminant. $x^2 + 2x + 6 = 0$

34. Determine whether the equation has 2 solutions, one solution, or no real solutions. $3x^2 - 12x + 12 = 0$

35. Simplify. $(x^3 + 5x^2 - 4x) - (3x^2 - 6x + 2)$

36. Simplify. $(4x^3 + x^2 - 1) + (2 - x - x^2)$

37. Find the product. $-4x^3(x^2 + 2x - 7)$

38. Find the product. $(x - 4)(2x + 1)$

39. Find the product. $(x + 2)^2$

40. Solve the equation. $3(x - 3)(x - 2) = 0$

41. Factor. $m^2 - 6m - 16$

42. Factor. $3x^2 - 8x + 4$

43. Factor. $ab + a + 4b + 4$

44. Solve by factoring. $y^2 + 4y - 32 = 0$

45. Solve by factoring. $2p^2 - p - 1 = 0$

46. Solve by factoring. $b^2 - 49 = 0$

47. Solve by factoring. $2x^2 - 10 = 0$

48. Solve the proportion. $\frac{7}{10} = \frac{9+x}{x}$

49. Write an equation such that *x* and *y* vary directly. $y = 50$ and $x = 10$

50. Write an equation such that *x* and *y* vary inversely. $y = 10$ and $x = 20$

51. Simplify. $\frac{3x}{9x^2 + 3}$

52. Simplify. $\frac{12x^2}{5x^3} \bullet \frac{25x^4}{3x}$

53. Simplify. $\frac{6y^2}{y+3} \div \frac{9y}{(y+3)^2}$

54. Simplify. $\frac{2x+1}{3x} + \frac{x+5}{3x}$

55. Simplify. $\frac{x}{x-5} + \frac{4}{x}$

56. Solve the equation. $\frac{1}{x} + \frac{x}{x+2} = 1$

57. Simplify the expression. $6\sqrt{2}-\sqrt{2}$

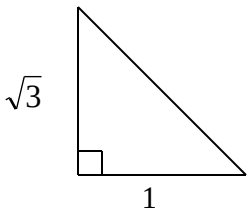
58. Simplify the expression. $\dfrac{5}{\sqrt{3}}$

59. Simplify the expression. $\sqrt{5}+\sqrt{20}-\sqrt{3}$

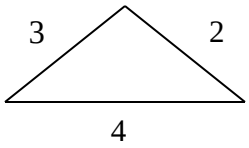
60. Solve the equation. $\sqrt{x-1}=5$

61. Solve the equation by completing the square. $x^2-4x-8=0$

62. Find the missing length of the right triangle. Simplify the answer (if possible).



63. Determine whether the given lengths are sides of a right triangle.



64. Find the distance between the two points. (4, - 1) and (1, - 5)

65. Find the midpoint of the segment connecting the given points. (- 1, - 3) and (5, 1)