Algebra 2 Final Review **Name:** _____

UNIT 1- Linear Systems

Identify the solution(s) to the system of equations.	
1. $\begin{cases} f(x) = 5x + 12 \\ g(x) = -4x - 8 \end{cases}$	2. $\begin{cases} f(x) = x^2 - 2x + 9 \\ g(x) = -x + 2 \end{cases}$

Unit 2- Quadratics

3. Solve by factoring: $x^2 - x - 30 = 0$	4. Solve by factoring: $x^2 + 17x + 42 = 0$
5. Solve using the quadratic formula: $-x^2 + 2x - 2 = 0$	6. Solve by completing the square: $x^2 + 2x - 9 = 0$
Simplify the radical to simplest form.	
7. $-5\sqrt{3} - 3\sqrt{3}$	8. $\sqrt{15}(\sqrt{6} + \sqrt{5})$
9. $\frac{\sqrt{3}}{4\sqrt{5}}$	10. $\sqrt{98k}$

UNIT 3 and 4- Polynomials

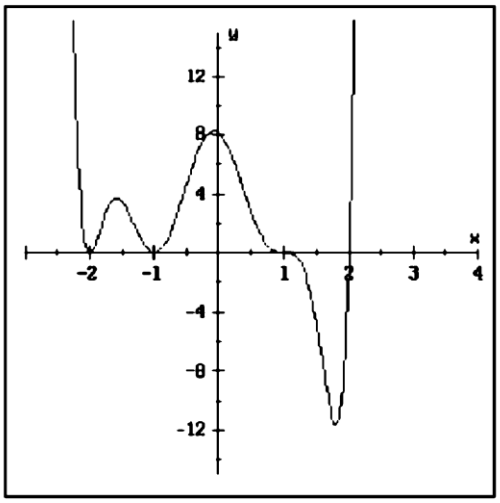
11. Completely determine all real roots for the following: $x^3 + x^2 – 5x + 3$

12. Completely determine all real roots for the following: $x^3 – 11x^2 – 25x – 13$

13. Create a polynomial with the following characteristics: degree 6, negative leading coefficient, 5 terms.

14. Identify the roots: $f(x) = x^2 - 4x + 15$

15. Given the following graph, find the Domain, Range, intervals of increasing/decreasing, zeros, max and min, and x and y intercepts.



Domain _____

Range _____

Intervals of Increase _____

Intervals of Decrease _____

Zeros (x-intercepts) _____

Max (local or absolute) _____

Min (local or absolute) _____

UNIT 5- Rational and Radical Functions

Perform the indicated operation.

16. $\frac{56}{x^2-16} \div \frac{7}{x-4}$

17. $\frac{16}{7} \div \frac{4}{13r}$

18. $\frac{4n}{n+6} \bullet \frac{8n+48}{4n}$

19. $\frac{2x}{x^2-16} + \frac{6}{x+4}$

20. $\frac{8}{b-7} - \frac{2b}{b^2-49}$

21. $\frac{9}{3d} - \frac{7}{5d^2}$

22. $\frac{3}{4k} + \frac{5}{k+2}$

Solve the rational equation.

23. $\frac{1}{6x} + \frac{1}{6x^2} = \frac{1}{6}$

24. $\frac{a+6}{4a^2} + \frac{3}{2a^2} = \frac{a+4}{2a^2}$

25. $\frac{7}{b-8} = \frac{1}{b-8} - 1$

26. $\frac{1}{r-2} + \frac{1}{r^2-7r+10} = \frac{6}{r-2}$

Solve for the given variable.

27. $\frac{7}{y+1} \geq 7$

28. $\frac{1}{b+1} + \frac{1}{b+1} > \frac{8}{15}$

29. $\frac{2}{w} + 3 \geq \frac{29}{w}$

Solve the equation for x.

30. $-2\sqrt{x+4} = -16$

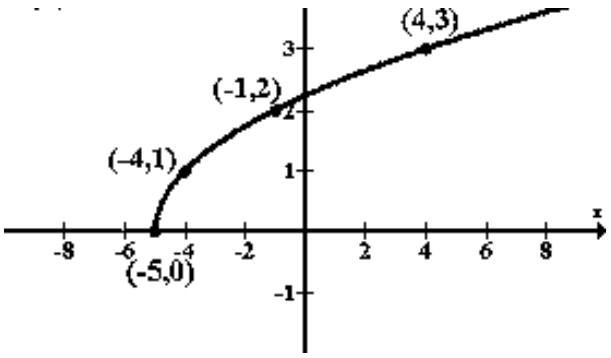
31. $\sqrt[3]{x+2} + 5 = 12$

32. $2 + \sqrt{x-4} = 7$

33. $x - 4 = \sqrt{2x}$

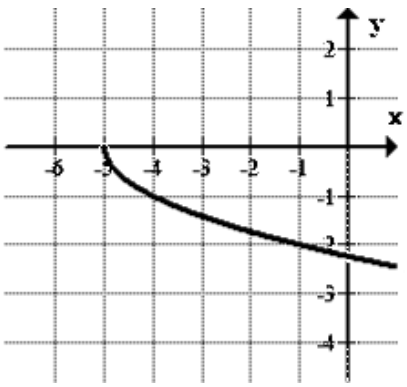
34. Identify the equation of the graph

y = _____



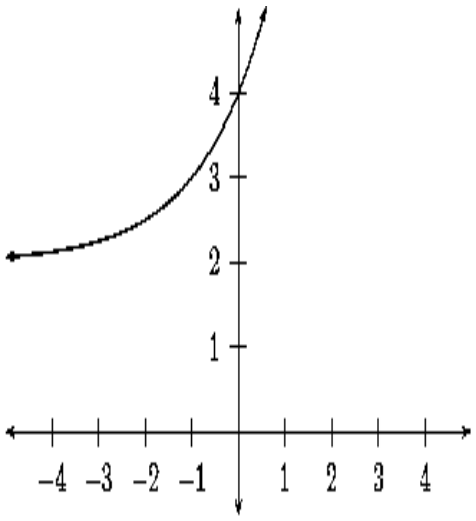
35. Identify the equation of the graph

y = _____



Unit 6- Exponentials and Logarithms

36. Given the graph below, determine the following characteristics:



Domain:

range:

y-intercept:

horizontal asymptote:

37. Write the expression in simplest form.

$$\frac{3x^0y^2z^{-2}}{9x^3y^y}$$

38. Write the expression in simplest form.

$$(x^2y^{-1}z^0)^3$$

39. Condense the logarithmic expression.

log 8 + log x - log 4 – log y

40. Expand the logarithmic expression.

$$\log 5x^2y^3$$

Solve the equations for x.

41. $5^{x+7} - 3 = 20$

42. $6e^{5x} + 12 = 96$

43. $\log_3(x+7) = 3$

44. $\log_7(3x-6) = \log_7(15)$

45. Emily starts a savings account with $5,000. How much money will she have after ten years if the interest is compounded monthly at a rate of 3%? $A = P\left(1+\frac{r}{n}\right)^{nt}$

Unit 7- Data analysis

46. The temperatures for September are normally distributed with a mean of 94º and standard deviation of 2º. What is the z-score for 91º?

$$z = \frac{x - \mu}{\sigma}$$

47. Snowfall in January is normally distributed with a mean of 4.5" and a standard deviation of .5". What percent of the data is below 5.1"?

48. The length of similar components produced by a company are approximated by a normal distribution model with a mean of 8 cm and a standard deviation of 0.04 cm. If a component is chosen at random

a) What is the probability that the length of this component is between 7.96 and 8.08 cm?

b) What is the probability that the length of this component is at least 7.88 cm?