Algebra 2 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Final Exam – Study Guide Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block: \_\_\_\_\_

**Unit 4 Review: Radicals & Rational Exponents**

Perform the indicated operation. Write your answer in simplest form.

|  |  |
| --- | --- |
| 1.)  | 2.)  |
| 3.)  | 4.)  |
| Rewrite the expression in radical form.5.)  6.)  | Rewrite the expression with rational exponents.7.)  8)  |

|  |  |
| --- | --- |
| 9) Simplify the expression . |  |

10. Perform the indicated operation$ 2\sqrt{x^{4}y^{3}}\*5\sqrt{x^{3}yz^{2}}$

11. State the radical conjugate for the expression  and then simplify completely.

Simplify each expression completely. Write your answer in simplest radical form.

|  |  |  |
| --- | --- | --- |
| 12)  | 13)   | 14)   |
| 15)  | 16)  | 17)  |
| 18.)  | 19.)  |

Describe the characteristics for each function.

20. 



|  |  |  |
| --- | --- | --- |
| Domain: \_\_\_\_\_ Range: \_\_\_\_\_\_ | x-intercept: \_\_\_\_\_\_\_ | y-intercept: \_\_\_\_\_\_\_ |
| Interval of Increase:Interval of Decrease: | Absolute Maximum:Absolute Minimum: | End Behavior: |

21. 



|  |  |  |
| --- | --- | --- |
| Domain: \_\_\_\_\_ Range: \_\_\_\_\_\_ | x-intercept: \_\_\_\_\_\_\_ | y-intercept: \_\_\_\_\_\_\_ |
| Interval of Increase:Interval of Decrease: | Absolute Maximum:Absolute Minimum: | End Behavior: |

Graph using transformations. Make sure to include the parent function on your graph.

22. 

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parent Function: | Vertical Reflection: | Horizontal Reflection: | Horizontal Shift: Direction? How many? | Vertical Shift: Direction? How many? |
|  |  |  |  |  |



23. 

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parent Function: | Vertical Reflection: | Horizontal Reflection: | Horizontal Shift: Direction? How many? | Vertical Shift: Direction? How many? |
|  |  |  |  |  |



Solve each equation; round any decimal to the TENTHS place. Remember to check for extraneous solutions

|  |  |
| --- | --- |
| 24.  | 25.  |
| 26.  | 27.  |

**Unit 5 Review: Exponential Functions**

Sketch the general shape of an exponential function given the following…

|  |  |
| --- | --- |
| 28.  | 29.  |
| 30. What must be true about a and b of the function  that corresponds to the given graph?  |

State whether each of the given functions represents exponential growth or decay. Then identify the “a” and “b” values.

|  |  |
| --- | --- |
| 31.  a = \_\_\_\_\_\_\_\_ b = \_\_\_\_\_\_\_ | 32.  a = \_\_\_\_\_\_\_\_ b = \_\_\_\_\_\_\_ |
| 33.  a = \_\_\_\_\_\_\_\_ b = \_\_\_\_\_\_\_ | 34.  a = \_\_\_\_\_\_\_\_ b = \_\_\_\_\_\_\_ |

35. Match the graph with the correct function below.

 A. 

 B. 

C. 

D. 

Identify the characteristics for the functions given below.

|  |  |
| --- | --- |
| 36. | Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Horizontal Asymptote: \_\_\_\_\_\_\_\_\_\_ X-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Y-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Interval of Increase or Decrease: \_\_\_\_\_\_\_\_\_\_\_End Behavior:  |
| 37. | Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Horizontal Asymptote: \_\_\_\_\_\_\_\_\_\_ X-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Y-Intercept: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Interval of Increase or Decrease: \_\_\_\_\_\_\_\_\_\_\_End Behavior:  |

Identify the transformations for the functions given below. Then graph the function using transformations.

|  |
| --- |
| 38.  |
| Parent Function: | Vertical Reflection? | Horizontal Reflection? | Horizontal Shift: Direction? How many? | Vertical Shift: Direction? How many? |
|  |  |  |  |  |
| Starting Points: | Horizontal Asymptote: |
|  |  |
| 39.  |
| Parent Function: | Vertical Reflection? | Horizontal Reflection? | Horizontal Shift: Direction? How many? | Vertical Shift: Direction? How many? |
|  |  |  |  |  |
| Starting Points: | Horizontal Asymptote: |
|  |  |
| Graph # 38 Here:2690_4[2] | Graph # 39 Here:2690_4[2] |

Solve each equation.

|  |  |  |
| --- | --- | --- |
| 40.  | 41.  | 42.  |

Match the application formula with the correct name.

|  |  |
| --- | --- |
| 43. Exponential Growth | A.  |
| 44. Exponential Decay | B.  |
| 45. Compound Interest | C.  |
| 46. Compound Continuously | D.  |

47. Suppose that $ 12000 is invested at 6% compounded quarterly.

a. What will the investment be worth after 5 years?

b. How much interest has been earned in the first 5 years?

48. You bought a guitar 6 years ago for $400, and its value is decreasing by about 13% per

 year. How much is your guitar worth now?

49. Your grandparents opened a college savings account for you on the day you were born. They found an investment that pays 8% annual interest, compounded monthly. How much money did they need to invest in order to have $40,000 in the account on your 18th birthday?

50. Find the interest on $2500 when invested at 4.8% annual interest compounded monthly for an eight year period.

51. A colony of algae increases in size by 15% each week. If 10 grams of algae are placed in a lake, find the weight of the algae that will be present in the lake after 12 weeks.

**Unit 6 Review: Logarithmic Functions**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Keeper # 35: Logarithmic Functions*Rewrite each equation in exponential form.

|  |  |
| --- | --- |
| 52.)  | 53.)  |

Rewrite each equation in logarithmic form.

|  |  |
| --- | --- |
| 54.)  | 55.)  |

Evaluate. Round any decimal answers to the hundredths place.

|  |  |  |
| --- | --- | --- |
| 56.)  | 57.)  | 58.)  |

*Keeper # 36: Properties of Logarithms*Expand the logarithm.

|  |  |
| --- | --- |
| 59.)  | 60.)  |

Condense the logarithm.

|  |  |
| --- | --- |
| 61.)  | 62.)  |

Use the change of base formula to evaluate.

|  |  |
| --- | --- |
| 63.)  | 64.)  |

*Keeper # 37: Solving using Logs*Solve. Round your answer to the hundredths place if necessary.

|  |  |
| --- | --- |
| 65.)  | 66.)  |
| 67.)  | 68.) |
| 69.)  | 70.)  |
| 71.)  | 72.)  |

*Keeper # 38:* Determine the inverse.

|  |  |
| --- | --- |
| 73.)  | 74.)  |
| 75.)  | 76.)  |

*Keeper #39: Characteristics & Graphing Logarithmic Functions*Graph the function. Then identify the characteristics.

|  |  |
| --- | --- |
| 77.)  | 78.)  |
| Domain: \_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_x-intercept: \_\_\_\_\_\_\_ y-intercept: \_\_\_\_\_\_\_\_\_ Asymptote: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ End Behavior: Interval of Increase or Decrease: \_\_\_\_\_\_\_\_\_ | Domain: \_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_x-intercept: \_\_\_\_\_\_\_ y-intercept: \_\_\_\_\_\_\_\_\_ Asymptote: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ End Behavior: Interval of Increase or Decrease: \_\_\_\_\_\_\_\_\_ |

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*Keeper # 40:: Applications of Logarithmic Functions*

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| --- |
| 79.) Maryville was founded in 1950. At that time, 500 people lived in the town. The population growth in Maryville follows the equation $y =500+1.5^{t}$, where t is the number of years since 1950.  A. Determine when the population had doubled since the founding.  B. In what year was the population predicted to reach 25,000 people? |
| 80.) Tanisha has $100 to invest at 8% per year in an account that is compounded continuously.  A. How long will it be before she has $150? B. What rate would Tanisha need to invest her money in order to make $300 in 7 years? |