**PreCalc Log & Exp Unit Review Sheet** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Unit 3 \* MEANS NO CALCULATOR**

1. Solve 

\*2. Rewrite in exponential form: 

\*3. Rewrite in logarithmic form & solve for *w*: 

\*4. Evaluate: 

\*5. Evaluate: 

\*6. Condense into a single logarithm:

a)  b) 

\*7. Expand the logarithm: $log\_{3}\frac{a^{4}b^{^{3}/\_{2}}}{(4c)^{2}}$

\*8. Evaluate: 

\*9. Write the function of the form  that goes through the points (0, 5) and (4, 20)

10. Given a population modeled by the function: .

a) Find the carrying capacity.

b) What is the population at time 0?

c) When will the population reach 2000?

d) What are the asymptotes for this function?

**SOLVE & SHOW ALL NECESSARY WORK**

11. $5^{3x+2}=7^{-3-x}$ 12. 

13.  14. $log\_{2}\frac{1}{32}=x$

15.  16. 

Please sketch a graph to help in your answer.

17. Analyze 

 D: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­\_

R: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

VA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

HA/EBA:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*x* – intercept(s): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*y* – intercept:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Extrema: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Increasing: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Decreasing:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Even/Odd: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Boundedness: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Continuity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

End Behavior: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. Evaluate  19. Simplify 

20. The number of North Carolina cows infected with the mad cow disease after t days is modeled by the function $ P\left(t\right)=\frac{578}{1+46e^{-.43t}}$. When will the number of cows be 473? SHOW ALL WORK.

21. Use the data below to find the ***exponential*** regression. Predict the population in Punxsutawney for 2015.

|  |  |
| --- | --- |
| Year | Punxsutawney Population |
| 1935 | 980 |
| 1945 | 1040 |
| 1968 | 1178 |
| 1979 | 1253 |
| 1993 | 1355 |
| 2002 | 1423 |

1. Population function:
2. Population in 2015:

22. A virus spreads according to N = N0e0.0345t where time is measured in days. If 10 people are currently infected, how long does it take for 100 people to be infected? SHOW ALL WORK.

23. Use Newton’s Law of Cooling: T(t) = Tm + (T0 – Tm) e-kt; A 6 pack of Coca Cola at room temperature (72˚F) is placed

 in a fridge (36˚F). After 23 minutes it’s temperature is down to 60˚F. How long will it take the soda to cool to 38˚F?

1. Use Newton’s Law of Cooling: T(t) = Tm + (T0 – Tm) e-kt; A cake comes out of a 350˚F oven and is set in a 70˚F room. After 10 minutes it’s temperature has cooled to 280˚F. How long will it take the cake to cool to 120˚F?
2. At this time in 1995, Ms. Willis deposited $2000 into an account at Wells Fargo that paid 4.7% interest compounded monthly.

a) How much money does she have in that account now?

b) What if it were compounded weekly instead?

1. What interest rate (still compounded monthly) would she need to have gotten in order to have $10,000 in the

account now?

1. Andrew contributes $50 per month into a Hoffbrau Fund that earns 15.5% annual interest. What is the value of his investment after 20 years?
2. Find Ms. Fischer’s quarterly payment if she wants to save $30,000 for her son’s college fund that he will need in eighteen years. Her account will pay 5.3% compounded quarterly.
3. What is Kim’s monthly payment for a 3 year $9000 car loan with a monthly compounded interest rate of 10.25% from BB&T?