Exponential and Logarithmic Functions (Chapter 7) Review Name: _____

Advanced Algebra with Trig, Glawe Period: _____

1) What has to be true for function to be an exponential growth?

2) What functions are the inverse functions of exponential functions?

3) What are the three main properties to simplify logarithmic functions?

4) $\log y =$ 5) $\ln y =$

Simplify the expression. Give exact answers (no decimals).

6) $8^{\log_8 3x}$ 7) $\log_4 64^{2x}$ 8) $3e^2 \cdot 4e^{-6}$

Expand the following logarithmic expression.

9) $\log_3 \frac{5x^3}{z^2}$ 10) $\log_2 \frac{xy}{4z^3}$

Condense the following logarithmic expression.

11) $2\log_2 4 + \log_2 x - 3\log_2 2$ 12) $\ln x + 4\ln y - 2\ln 6 - 3\ln z$

Solve the logarithmic or exponential equation. ***Check for extraneous solutions.***

13) $3e^{2x} = 15$ 14) $\left(\frac{1}{16}\right)^{x-3} = 64^{2x+1}$ 15) $2^{3x-3} = 16^{4x-1}$

16) $\ln(7x-4) = \ln(2x+11)$ 17) $\log 5x + \log(x-1) = 2$ 18) $\log_4(x+12) + \log_4 x = 3$

Fill in a table of values for the translated function *(you can fill it in for the parent function if you would like)*. Then identify the domain, range, and asymptote of the function.

19) $y = 3^{x+2} - 1$

x	y

x	y

Domain:_____

Range:_____

Asymptote:_____

$y = b^x \quad y = b^{x-h} + k$

20) $y = \log_2(x-1) + 2$

x	y

x	y

Domain:_____

Range:_____

Asymptote:_____

$y = \log_b x \quad y = \log_b(x-h) + k$

Find the inverse of the given function.

21) $y = 2e^{x+1}$

22) $y = 4^{x-2}$

23) $y = \frac{1}{3} \cdot \ln(x+4)$

24) $y = 4\log(x-2)$

Exponential Functions: $y = a(1+r)^t \quad A = Pe^{rt} \quad A = P\left(1 + \frac{r}{n}\right)^{nt} \quad y = a(1-r)^t$

25) In 2008, roughly 1.7 million people owned a Smart Phone. In the next 4 years, the number of Smart Phones increased by about 114% each year. About how many people owned a Smart Phone in 2011?

26) Your parents bought a car 4 years ago for $31,262. If its value decreases by 16% each year, how much is the car worth now?

27) You deposit $1500 into a bank account that pays 8% annual interest. Calculate the final amount after 4 years if the interest is…

a) Compounded *Semi-annually*:

b) Compounded *Continuously*:

28) The *apparent magnitude* of a star is a measure of the brightness of the star as it appears to observers on Earth. The apparent magnitude *M* of the dimmest star that can be seen with a telescope is given by the function $M = 5\log D + 2$ where *D* is the diameter (in millimeters) of the telescope's objective lens. If a telescope can reveal stars with a magnitude of 12, what is the diameter of its objective lens?