Honors Algebra Chapter 7 Review Name Key

1. Identify the follwing as expnential growths or exponential decays.

a) $y = 2\left(\frac{1}{6}\right)^x$ b) $y = 5\left(\frac{7}{3}\right)^{-x}$ c) $y = e^{2x}$

Decay Decay Growth

2. In the exponential function $f(x) = ab^{x-c} + d$, describe the effect a,b,c, and d have on the graph.

a - stretch factor
b - base
c - left/right shift
d - up/down shift

3. Rewrite the following equations in log form.

a) $216 = 6^3$ b) $5^{-3} = \frac{1}{125}$ c) $\left(\frac{2}{3}\right)^{-2} = \frac{9}{4}$

$\log_6 216 = 3$ $\log_5 \frac{1}{125} = -3$ $\log_{\frac{2}{3}} \frac{9}{4} = -2$

4. Rewrite the following equtions in exponential form.

a) $\log_3 81 = 4$ b) $\log_8 \frac{1}{64} = -2$ c) $\log_{25} 5 = \frac{1}{2}$

$3^4 = 81$ $8^{-2} = \frac{1}{64}$ $25^{\frac{1}{2}} = 5$

5. Evaluate without a calculator.

a) $\log_4 64$ b) $\log_{\frac{1}{3}} 27$ c) $\log_{\otimes} \otimes^{\Omega}$

3 -3 Ω

6. Find the inverse of each.

a) $y = \log_{29} x$ b) $y = 3^x - 1$ c) $y = \ln(x-1)$

$y = 29^x$ $\log_3(x+1) = y$ $y = e^x + 1$

7. Expand or condense.

a) $2\log x + \log y - 3\log z$ b) $\ln 3x^2y^7\sqrt{z}$ c) $\log_6 \frac{6x^2}{y^8}$

$1 + 2\log_6 x - 8\log_6 y$

$\log \frac{x^2 y}{z^3}$ $\ln 3 + 2\ln x + 7\ln y + \frac{1}{2}\ln z$

8. Use your table to find the following.

a) $\log 789$

2.8971

b) $\log(.123)$

$-.9101$

9. Solve the following.

a) $\frac{1}{9} = 27^x$ b) $\log_{30}(2x+5) = \log_{30}(x-2)$ c) $3\log_4(x-1) = 6$ d) $3(5)^{2x-3} = 13$

$x = -\frac{2}{3}$ $x = 7$ $x = 17$ $x \approx 1.9555$

10. Find the inverses of each of the following.

a) $y = 6^x - 3$ b) $y = \log_5(x-4)$ c) $y = 12^{x+3} - 5$

$\log_6(x+3)$ $y = 5^x + 4$ $\log_{12}(x+5) - 3$

11. Find an exponential function whose graph passes through the points $(2, 12.5)$ and $(3, 31.25)$.

$y = 2 \cdot \left(\frac{5}{2}\right)^x$

12. Find a power function whose graph passes through the points $(2.9, 9.4)$ and $(7.3, 12.8)$

$y = 6.58\, x^{.33}$

13. Suzy put $1,000 in the bank on January 1, 2000. If she received 6% interest compounded continuously, ~~who~~ how much as in her account on January 1, 2008?

$1616.10

14. The population of Suzyville has been decreasing by 6.5% every year since she left in 1997 when the population was 43,500. How long until the population is 20,000?

11.56 years

15. ~~Suzy bought a new car in 2001 for $25,000. It decreases in value by 13% every year. How long will it be before the car is worth $15,000?~~

8.9 %

16. Suzy cooked some soup for lunch. The soup was 200° in the pot while the room temperature was 72°. She put some in a bowl to cool while she took a 15 minute shower. If the cooling rate of the soup is $r = .056$, what will the temperature of the soup be after her shower? How long would it take for the soup to cool to 100°?

A) 127.26° B 27.14 min