Chapter 7 Review

SCORE _____

Write the letter for the correct answer in the blank at the right of each question.

1. Find the domain and range of the function $y = 3\left(\frac{1}{5}\right)^x$

A D = {all real numbers}
R = $\{y \mid y < 0\}$

B D = {all real numbers}
R = $\{y \mid y > 0\}$

C D = $\{x \mid x > 0\}$
R = $\{y \mid y > 0\}$

D D = $\{x \mid x > 0\}$
R = {all real numbers}

1. _____

2. Which function represents exponential *decay*?

F $y = \frac{1}{100}(6)^x$ **G** $y = (4x)^{\frac{1}{2}}$ **H** $y = 2\left(\frac{4}{3}\right)^x$ **J** $y = 12\left(\frac{1}{8}\right)^x$

2. _____

3. Use the equation of the exponential function whose graph passes through the points (0, –3) and (2, –48) to find the value of y when $x = -2$.

A $-\frac{3}{4}$ **B** $-\frac{3}{8}$ **C** $-\frac{3}{16}$ **D** 48

3. _____

4. Solve $4^{-2x+7} = 32^{x-8}$.

F 0 **G** 2 **H** 4 **J** 6

4. _____

5. Solve $\left(\frac{1}{36}\right)^n = 216^{n+5}$.

A 10 **B** 3 **C** –3 **D** –10

5. _____

6. Solve $81^y < 27^{y+3}$.

F $\{x \mid y < -9\}$ **G** $\{x \mid y > 9\}$ **H** $\{x \mid y > -9\}$ **J** $\{x \mid y < 9\}$

6. _____

7. Write the equation $6561^{\frac{1}{4}} = 9$ in logarithmic form.

A $\log_{\frac{1}{4}} 9 = 6561$

B $\log_{6561} 9 = \frac{1}{4}$

C $\log_9 6561 = \frac{1}{4}$

D $\log_{\frac{1}{4}} 6561 = 9$

7. _____

8. Evaluate $5^{\log_5 63}$.

F 58 **G** 315 **H** $\log_5 63$ **J** 63

8. _____

9. Solve $\log_{\frac{1}{5}} x = -1$.

A $\frac{1}{25}$ **B** –5 **C** 5 **D** $-\frac{1}{5}$

9. _____

10. Solve $\log_3(5x + 1) \geq \log_3(3x + 1)$

F $\{x \mid x \geq 3\}$ **G** $\{x \mid x \geq 4\}$ **H** $\{x \mid x \leq 6\}$ **J** $\{x \mid x \geq 27\}$

10. _____

NAME _____ DATE _____ PERIOD _____

11. Use $\log_5 2 \approx 0.4307$ and $\log_5 3 \approx 0.6826$ to approximate the value of $\log_5 54$.

A 0.1370 **B** 2.4785 **C** 0.8820 **D** 0.7488

11. _____

12. Solve $\log_4(m-3) + \log_4(m+3) = 2$.

F $\sqrt{11}$ **G** 5 **H** 1 **J** –5.5

12. _____

13. Solve $6^{3n} = 43^{5n-4}$. Round to the nearest ten-thousandth.

A 1.1202 **B** –1.9005 **C** –0.2800 **D** 2.1418

13. _____

14. Solve $5^{2x+1} \geq 50$. Round to the nearest ten-thousandth.

F $\{x \mid x \geq 4.5000\}$ **G** $\{x \mid x \geq 0.7153\}$ **H** $\{x \mid x \geq 0\}$ **J** $\{x \mid x \geq 2.4307\}$

14. _____

15. Use common logarithms to approximate $\log_9 207$ to four decimal places.

A 0.4120 **B** 1.3617 **C** 3.2702 **D** 2.4270

15. _____

16. Suppose you deposit \$1000 in an account paying 3% annual interest, compounded continuously. Use $A = Pe^{rt}$ to find the balance after 10 years.

F \$20,085.54 **G** \$1300 **H** \$1349.86 **J** \$1068.65

16. _____

17. Solve $4 + 3e^{5x} = 27$.

A 0.4074 **B** 0.4394 **C** 2.0369 **D** 0.1769

17. _____

18. Solve $\ln(x+5) \geq 2$.

F $\{x \mid x \geq 2.3891\}$ **G** $\{x \mid x \leq 2.3891\}$ **H** $\{x \mid x \geq 12.3891\}$ **J** $\{x \mid x \leq 12.3891\}$

18. _____

19. CHEMISTRY A particular compound decays according to the equation $y = ae^{-0.0974t}$, where t is in days. Find the half–life of this compound.

A about 5.1 days **C** about 7.1 days
B about 7.4 days **D** about 9.7 days

19. _____

20. TOURISM At a town with a large convention center, the cost of a hotel room has increased 5.1% annually. If the average hotel room cost \$48.00 in 1980 and this growth continues, what will an average hotel room cost in 2012? Use $y = a(1 + r)^t$ and round to the nearest cent.

F \$143.38 **G** \$235.79 **H** \$126.34 **J** \$87.19

20. _____