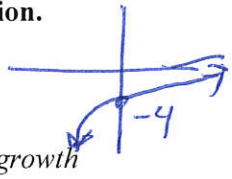
NAME Key DATE _____ PERIOD _____

Chapter 7 Practice Test

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 $y = -4\left(\frac{3}{4}\right)^x$



2. Create two exponential equations, where one function represents exponential *growth* while the other equation represent exponential *decay*.

1. D: $\mathbb{R}$ R: $y < 0$

2. $y = 3^x$ $y = (\frac{1}{2})^x$

3. Use the equation of the exponential function whose graph passes through the points (0, 4) and (1, 24) to find the value of y when $x = -2$.

$y = ab^x$ $a = 4$ $y = 4 \cdot 6^x$ $y = 4 \cdot 6^{-2}$

$4 = a \cdot b^0$ $24 = 4b^1$ $y = \frac{4}{36} = \frac{1}{9}$

$b = 6$

3. $\frac{1}{9}$

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

$(2^3)^{x+2} = (2^5)^{2x+4}$ $3(x+2) = 5(2x+4)$ $-14 = 7x$

$3x + 6 = 10x + 20$ $-2 = x$

4. $x = -2$

5. Solve $\left(\frac{1}{216}\right)^n = 6^{n+4}$.

$(6^{-3})^n = 6^{n+4}$ $-3n = n + 4$ $-4n = 4$

5. $n = -1$

6. Solve $32^x < 16^{x+2}$.

$(2^5)^x < (2^4)^{x+2}$ $5x = 4x + 8$

$x = 8$

6. $x = 8$

7. Write the equation $2401^{\frac{1}{4}} = 7$ in logarithmic form.

$\log_{2401} 7 = \frac{1}{4}$

7. _____

8. Evaluate $6^{\log_6 45}$.

$x = 45$...

$f(f^{-1}(x)) = x$

inverses, or $f^{-1}(f(x)) = x$

8. 45

9. Solve $\log_{\frac{1}{6}} x = -2$.

$\left(\frac{1}{6}\right)^{-2} = x$

9. $x = 36$

10. $\log_5(8x) > \log_5(3x + 10)$.

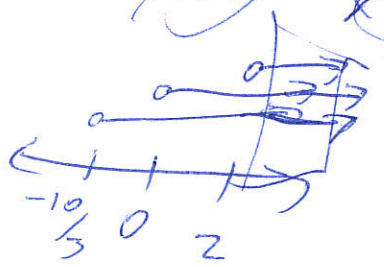
$8x > 3x + 10$

$5x > 10$

$x > 2$

$8x > 0$ $3x + 10 > 0$

$x > 0$ $x > -\frac{10}{3}$



10. $x > 2$

NAME Key DATE _____ PERIOD _____

Chapter 7 Practice Test *(continued)*

11. Use $\log_5 2 \approx 0.4307$ and $\log_5 3 \approx 0.6826$ to approximate the value of $\log_5 48$

$\log(48) = \log(2\cdot2\cdot2\cdot2\cdot3) = \log(2^4\cdot3) = \log 2^4 + \log 3$
$= 2^{4\cdot3}$ $= 4\log 2 + \log 3$
$= 4(.4307) + (.6826)$
1.099

11. 2.4054

12. Solve $\log_2(2x^2 - 7x) + \log_2 x = 3$.

$\log_2(2x^2-7x) = 3 \rightarrow 2x^2-7x-8=0$
$2x^2-7x=8$ $(2x+1)(x-4)=0$

12. $x = -\frac{1}{2}, 4$

13. Solve $6^{n-2} = 50$. Round to the nearest ten-thousandth.

$\log 6^{n-2} = \log 50 \rightarrow n-2 = \frac{\log 50}{\log 6} \mid n = \frac{\log 50}{\log 6} + 2$ or

13. ≈ 4.1832

14. Solve $4^{3x+1} < 28$. Round to the nearest ten-thousandth.

$3x+1 < \frac{\log 28}{\log 4} < 1.447$ $1.447 \rightarrow \frac{\log 28}{3\log 4}$ $.7782 - \frac{1}{3}$ or
$\log 4 \leftarrow .6020$ $1.8062 \quad x = .6020$

14. $\approx .4678$

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

$\frac{\log 27}{\log 9} = \frac{1.4314}{.9542}$ or

15. ≈ 1.500

16. Suppose you deposit \$3000 in an account paying 2% annual interest, compounded continuously. Use $A = pe^{rt}$ to find the balance after 5 years.

$A = 3000e^{(.02)(5)}$ $\uparrow$ $\leftarrow 2.079$

16. 3315.512

17. Solve $4 + 3e^{5x} = 28$.

$3e^{5x} = 24 \rightarrow e^{5x} = 8$ $x = \frac{\ln 8}{5}$ or

17. $\approx .4159$

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

$x+5 \geq e^2$ $x \geq e^2 - 5$ (≈ 2.38) $\mid x+5>0$ $x>-5$

$-5 \quad e^2-5$

e^2-5 or

18. $x \geq 2.38$

19. CHEMISTRY A particular compound decays according to the equation $y = ae^{-0.0825t}$, where t is in days. Find the half–life of this compound.

$\frac{1}{2}a = ae^{-.0825t}$ $\ln\frac{1}{2} = -.0825t$
$-0.69 = -.0825t$

$\frac{\ln 1/2}{-.0825}$ OR

19. -8.401

20. ANTIQUITY At a town with an annual Magic tournament, the cost of a beta starter deck has increased 6.2% annually. If the average beta starter deck cost \$19.00 in 1992 and this growth continues, what will an average hotel room cost in 2017? Use $y = a(1 + r)^t$ and round to the nearest cent.

$t = 2017 - 1992 = 25$ $y = 19(1+.062)^{25}$
$y = 19(1.062)^{25}$

20. $\approx \$85.48$

Bonus Solve a really cool problem ... ?

B: (1pt)