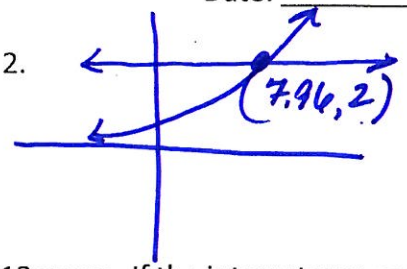
*AAT

Name: Key

Chapter 5: Test Review

Date: _____ Period: _____

1. Let $y = (1.091)^x$. Use a graph to estimate x if y = 2.

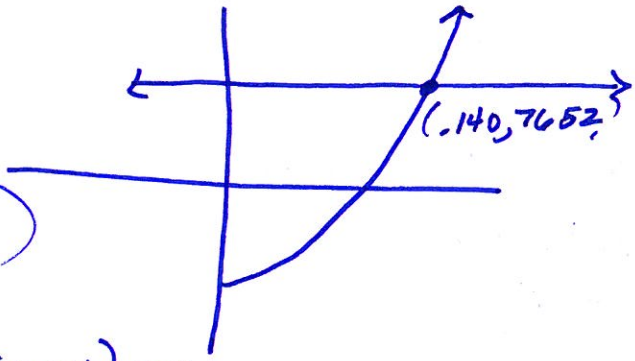


$x = 7.96$

2. An investment of $1,235 increased to $7,652 in 13 years. If the interest was compounded continuously, find the interest rate.

$A = Pe^{rt}$

$7652 = 1235e^{r(13)}$



$\begin{bmatrix} .01 \\ .5 \\ 1 \end{bmatrix} \begin{bmatrix} 100 \\ 8000 \\ 500 \end{bmatrix}$

$r \approx 14\%$

3. Find the zeros of $f(x) = x^3(5e^{5x}) + 4x^2e^{5x}$

$x^2e^{5x}(5x+4) = 0$

$x = 0$ d.r.

$5x + 4 = 0$

$5x = -4$

$x = -\frac{4}{5}$

4. Simplify the expression.

$$\frac{(e^w + e^{-w})(e^w + e^{-w}) - (e^w - e^{-w})(e^w - e^{-w})}{(e^w + e^{-w})^2}$$

$$\frac{(e^{2w} + 1 + 1 + e^{-2w}) - (e^{2w} - 1 - 1 + e^{-2w})}{(e^w + e^{-w})^2} = \frac{4}{(e^w + e^{-w})^2}$$

5. Estimate y if x = 40.

$y = e^{0.07x}$

$y = e^{.07(40)}$

$y = 16.44$

6. Change to exponential form.

$\log_5 \frac{1}{125} = -3$

$5^{-3} = \frac{1}{125}$

7. Change to exponential form.

$\ln x = 0.9$. $e^{.9} = x$

8. Find the number.

$\log_8 8^1$ 1

9. Solve the equation.

$\log_2 x = \log_2(10-x)$

$x = 10-x$

$2x = 10$

$x = 5$

10. Express in terms of logarithms of positive real numbers x,y, z, w.

$\log_2 \frac{x^4 w}{y^5 z^3}$ $\log_2 x^4 + \log_2 w - \log_2 y^5 - \log_2 z^3$

$4\log_2 x + \log_2 w - 5\log_2 y - 3\log_2 z$

11. Find the exact solution using common logarithms and a two-decimal -place approximation of the solution of the equation.

$9^{x+5} = 7^{1-4x}$

$\log 9^{(x+5)} = \log 7^{(1-4x)}$

$(x+5)\log 9 = (1-4x)\log 7$

$x\log 9 + 5\log 9 = \log 7 - 4x\log 7$

$x\log 9 + 4x\log 7 = \log 7 - 5\log 9$

$x(\log 9 + 4\log 7) = \log 7 - 5\log 9$

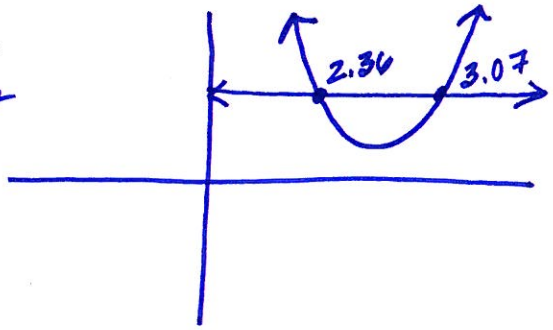
$\frac{x(\log 9 + 4\log 7)}{(\log 9 + 4\log 7)} = \frac{\log 7 - 5\log 9}{(\log 9 + 4\log 7)}$

$x \approx -0.91$

12. Find the solution(s) of the equation.

$3^x + 81^{(3-x)} = 30$.

Y_1 Y_2



$x = 2.36$ $x = 3.07$

13. Use the change of base formula to approximate the y-intercept.

$f(x) = \log_2(x+11)$

$\log_2(0+11)$

$= \log_2 11$

$= \frac{\log 11}{\log 2} \approx 3.4594$

14. Solve the equation.

$36^{2x}\left(\frac{1}{6}\right)^{x+2} = 216(6^x)^{-2}$

$6^{2(2x)}6^{-1(x+2)} = 6^3 6^{-2x}$

$4x + -x - 2 = 3 + -2x$

$5x = 5$

$x = 1$