SM3 Solving Logarithmic Equations 2019-2020

Name _____ Date _____ Period _____

Find the exact solution algebraically, and check it by substituting into the original equation. Show work!

1. $32\left(\dfrac{1}{4}\right)^{x/3}=2$

2. $2\cdot5^{x/4}=250$

3. $3\left(5^{-x/4}\right)=15$

4. $\log_2 x=5$

5. $\log x=3$

6. $\log_4(x-5)=-1$

Solve each equation. If necessary, obtain a numerical approximation for your solution by rounding to the nearest ten thousandths.   Check your solution by substituting into the original equation. Show work!

7. $3^x=25$

8. $0.95^x=1.3$

9. $40e^{0.025x}=200$

10. $3+2e^{-x}=11$

11. $4^{5-x}-2=13$

12. $\ln x^2=6$

13. $\log x^2 = 4$

14. $\log_3(3x - 2) = 3$

15. $\log_3 x = \log_3 7$

16. $\log_5 x = \log_5(2x - 3)$

17. $\log_{10} 2 + \log_{10}(x + 21) = 2$

18. $\log_9 5 + \log_9(n + 1) = \log_9 6n$

19. $\log_3 2 + \log_3 8 = \log_3 2x$

20. $\log_5 42 - \log_5 7 = \log_5(3x - 1)$

21. The value of a Honda Civic DX that is t years old can be modeled by $V(t) = 16{,}775(0.905)^t$.

According to the model, when will the car be worth $15,000? $8,000? $4,000? Show work!