PROBLEM SET 8-5
(Exponential and Logarithmic Equations)

Use the Change of Base Formula to evaluate each expression. Then convert it to a logarithm in base 8.

1. $\log_2 9$

2. $\log_4 8$

3. $\log_3 54$

4. $\log_5 62$

Solve each equation.

5. $\log 2x = -1$

6. $\log (3x + 1) = 2$

7. $\log (5 - 2x) = 0$

8. $2 \log x + \log 4 = 2$

9. $\log 5 - \log 2x = 1$

10. $\log (7x + 1) = \log (x - 2) + 1$

11. $\frac{1}{2} \log x + \log 4 = 2$

12. $\log x^2 = 2$

Solve each equation. If necessary, round to the nearest ten-thousandth.

13. $8^x = 444$

14. $9^{2x} = 42$

15. $12^{4-x} = 20$

16. $4^{3x} = 77.2$

17. $3^x + 0.7 = 4.9$

18. $7^x - 1 = 371$

19. $5^{3x} = 125$

20. $2.1^x = 9$