Solve the following exponential or logarithmic equations without using a calculator for 1-5.

1. a) \(2^{2x^2-7x} = 16\)  
   b) \(5^x = 26\)

2. \(\log(4) + \log(2x - 1) = \log(x + 3)\)

3. \(\log_2 x = 5\)

4. \(4^{2x} - (5)4^x = -4\)

5. \(\log_2(x + 1) + \log_2 x = 1\)
6. Find the domain and range of \( f(x) = \log (x - 7) \)

7. The formula for the accumulated amount, \( A \), of an investment (or loan) is given by the formula, \( A = P(1 + \frac{r}{n})^{nt} \), where \( P \) is the principal, \( r \) is the annual interest rate, \( n \) is the number of times the interest is compounded each year, and \( t \) is the number of years. Find the accumulated amount on an investment of $9,000 at 2.9% annual interest, compounded monthly over 8 years. Round your answer down to the nearest cent.

8. Write the following logarithmic expression as the sum/or difference of logs:
\[
\log \frac{7y^4x}{4(x+2)^2}
\]

9. Write the following logarithmic expression as a single log:
\[
3 \log_5(4x + 7) + 4\log_5(2x) - 5\log_5 y
\]

10. The number \( A \) of bacteria found in a culture is a function of time, \( t \), in minutes and is given by the formula \( A = A_0 e^{0.9t} \) with the initial value \( A_0 = 1500 \). After how many minutes will there be four times the initial amount of bacteria? Round to 2 decimal places.
11. Switch the following into logarithm form: \(4^x = 16\). Explain how the two types of functions are related as inverses by sketching the graphs and stating domain and range of each form.

12. Evaluate \(\log_7 10\) to three decimal places.

13. a) Find the inverse of \(f(x) = \sqrt{x + 9}\)

b) State the domain and range of \(f(x)\) and \(f^{-1}(x)\).

c) Prove they are inverses using \(f(g(x)) = g(f(x)) = x\)

14. If \(f(x) = 3x^2 - 6x + 4\) and \(g(x) = 2x\), find \((f \circ g)(x)\).