1. Simplify: $\log_3 81$.
    - a) 4
    - b) 3
    - c) 5
    - d) 6
2. Solve for x: $3^{x+1}=81$.
    - a) 2
    - b) 3
    - c) 4
    - d) 5
3. If $f(x)=2e^x$, what is f(0)?
    - a) 1
    - b) 2
    - c) 0
    - d) e
4. What is the domain of $y = ln(x - 3)$?
    - a) $x>3$
    - b) $x\geq 3$
    - c) $x<3$
    - d) $x\neq 3$

---

6. Expand $\log(x^2y)$ into simpler terms.
7. Solve for x:

$$log_2(x - 3) + log_2(x + 1) = 3$$

8. If the population of a town follows the exponential model $P(t)=5000e^{0.02t}$, where t is in years:
    - Find the population after 10 years.
9. Given $f(x)=3x+2-5$, determine the range of f(x).
10. Rewrite ln(8) in terms of log(8).

---

11. Sketch the graph of $y=2^x+3$, showing key points, asymptotes, and transformations.

---

16. A company's revenue, R, in millions of dollars, is modeled by the function $R(t)=10+5\ln(t+1)$, where t is the number of years since the company was founded.
    - a) Determine the revenue after 4 years.
    - b) After how many years will the revenue reach 20 million dollars?
17. The pH of a solution is given by $pH=-\log[H^+]$, where $[H^+]$ is the hydrogen ion concentration. If a solution has a pH of 3.5:
    - a) Find the hydrogen ion concentration.
    - b) What is the pH if the concentration doubles?
18. A car depreciates in value exponentially, modeled by $V(t)=V_0e-0.15t$, where $V_0$ is the initial value and t is time in years. If the car was initially worth $30,000:
    - a) What is its value after 5 years?
    - b) How long will it take for the value to drop to $10,000?
19. Solve and verify:

$$ln(x+1)-ln(x-2)=ln(3)$$

20. Consider the equation $2^{x+1}=5x$. Solve for x to two decimal places using logarithms.