Exponential & Logarithmic Expressions Group Activity

Objective:

- Simplify expressions involving exponential and logarithmic functions

- Develop algebraic manipulation skills involving roots, rational expressions, and combined functions.

Part 1: Group Problem Solving (55 minutes)

The class will be divided into small groups of 3–4 students each. Each group will complete the problems on this worksheet. Each group will solve the problems **collaboratively**, discussing their reasoning and strategies as they go.

Part 2: Group Reflection and Sharing (10 minutes)

Each group will pick one problem they found most challenging or interesting. They explain how they solved it and what strategies worked best.

Part 1: Factor the following exponential expressions.

1. $e^x(3x + 4) + 2xe^x$

3. $e^x\sqrt{x} + \dfrac{e^x}{2\sqrt{x}}$

2. $3^x(x^2 + 1) - 2x \cdot 3^x$

4. $2^{2x} \cdot x^2 - 9 \cdot 4^x$

Part 2: Simplify the following logarithmic expressions.

1. Simplify: $\ln e^{3x} - \ln e + \log_3 27$

3. Expand: $\ln\left(\dfrac{2x^6(x+1)^2}{(x-5)^5}\right)$

2. Expand: $\ln\left(\dfrac{e^{2x+1}}{x^2}\right)$

4. Condense into a single logarithm:
$\ln(x^4) - 3\ln x + \ln 1$